

DOCUMENT RESUME

ED 159 310

08

CE 013 881

TITLE Preparation for Careers in Transportation. Teachers Guide.

INSTITUTION Ohio State Dept. of Education, Columbus. Div. of Vocational Education.

SPONS AGENCY Bureau of Adult, Vocational, and Technical Education (DHEW/OE), Washington, D.C. Curriculum Center for Occupational and Adult Education.

BUREAU NO 157017

PUB DATE 73

GRANT OEG-0-71-4691(357)

NOTE 116p.; For related documents see CE 013 877-885

EDRS PRICE MF-\$0.83 HC-\$6.01 Plus Postage.

DESCRIPTORS *Bibliographies; Career Awareness; *Career Education; Career Exploration; Career Planning; Cooperative Programs; Correspondence Courses; Curriculum Guides; Educational Objectives; Individualized Programs; Learning Activities; Learning Modules; Models; Occupational Information; Performance Based Education; *Program Planning; Resource Materials; Role Perception; School Industry Relationship; Senior High Schools; Student Teacher Relationship; *Trade and Industrial Education; *Transportation

ABSTRACT

One in a series devoted to transportation career education, this guide which is intended for use by teachers in grades 11 and 12, presents a program to prepare students for careers in transportation. Section I gives an introduction to career education and its four phases: career awareness, orientation, exploration, and preparation. Section II stresses the use of resource materials for occupational information on transportation careers. Section III explains the roles of the educational, family, and industrial participants in a career preparation program. Section IV describes five program types in which the program plan can be used (e.g., in-school training, correspondence course, etc.). Section V discusses the program plan and model, emphasizing the use of individualized learning modules. Six objectives are identified for the student: the affirmation of career plans developed in the career exploration program; determination of immediate career preparation; choice of program for career preparation; participation in appropriate learning experiences; refinement of career plan in light of learning experiences; and upon graduation, entrance to a job or postsecondary program. For each objective, activities are suggested both here and in a separate student manual (CE 013 882). Section VI provides a bibliography of resource materials available on transportation.

(ELG)

* Reproductions supplied by EDRS are the best that can be made *
 * from the original document. *

PREPARATION FOR CAREERS IN TRANSPORTATION

TEACHER'S GUIDE

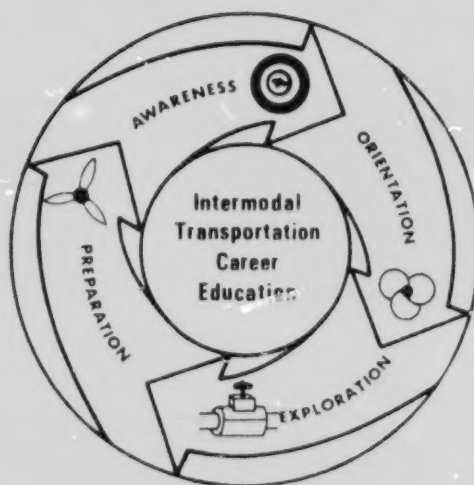
U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS GUIDE IS ONE OF A SERIES
OF GUIDES FOR THE TEACHER
IN THE PREPARATION OF
CAREERS IN TRANSPORTATION
FOR THE STUDENT IN THE
SCHOOL OF VOCATIONAL
EDUCATION.

PREPARED BY THE
NATIONAL INSTITUTE OF
EDUCATION

R. D. Balthaser

FOR THE STUDENT IN THE
SCHOOL OF VOCATIONAL
EDUCATION



THE TRANSPORTATION CURRICULUM PROJECT

Division of Vocational Education
Ohio Department of Education

PREPARATION
FOR
CAREERS IN TRANSPORTATION
TEACHERS GUIDE

produced for

The United States Office of Education
Bureau of Adult, Vocational and Technical Education
Curriculum Center for Occupational and Adult Education

pursuant to

Project No. 157017

Grant No. OEG-O-71-4691 (357)

prepared by

The Transportation Curriculum Project
Division of Vocational Education
Ohio Department of Education
88 East Gay Street - Suite 708
Columbus, Ohio 43215

Copyright 1973

The project presented or reported herein was performed pursuant to a Grant from the U. S. Office of Education, Department of Health, Education and Welfare. However, the opinions expressed herein do not necessarily reflect the position or policy of the U. S. Office of Education, and no official endorsement by the U. S. Office of Education should be inferred.

Copyright. The material contained herein is under development pursuant to Grant Number OEG - O - 71 - 4691 (357) from the U. S. Office of Education, Department of Health, Education and Welfare and is protected under the U. S. Office of Education Copyright Program. No part of this publication may be used for instructional purposes or reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior written permission. Inquiries should be directed to The Transportation Curriculum Project, Division of Vocational Education, Ohio Department of Education, 85 East Gay Street (Suite 708), Columbus, Ohio 43215.

Discrimination Prohibited — Title VI of the Civil Rights Act of 1964 states: "No person in the United States, shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance." Therefore, The Transportation Curriculum Project, like all other programs or activities receiving financial assistance from the Department of Health, Education and Welfare, must be operated in compliance with this law.

PREFACE

Increased public demand for more and better transportation has resulted in an increased demand for workers with more and better training. Recognizing the need for school curricula directed toward preparing young people for these opportunities, this guide presents a program of preparation for existing and emerging careers in the field of transportation. The program is designed for use in senior high schools but its use elsewhere is to be encouraged as well. This guide is intended primarily for the teacher who is responsible for programs designed to prepare students for careers in transportation. It has been written and reviewed by professionals from the transportation industry, from career education and from transportation education; people who sincerely believe that preparing young people for careers in transportation is important. The material presented is factual, accurate and reflects the most up-to-date thinking in both transportation and career education.

The compilers of this guide tried to anticipate the needs and problems in implementing this program and integrating it with career preparation programs already existing in senior high schools. There is probably no doubt that we have fallen short. But, fortunately, there is one factor in the American classroom that can usually succeed in the most difficult of conditions; that factor is YOU, the teacher, a guide and helper who is actually there with the students. In implementing this program you will share in the career preparation process with your students. Ultimately, their success will be your success.

While this guide represents hundreds of hours of effort and years of experience by dedicated persons in education and the transportation industry, not every bit of information nor every paragraph of advice is intended to be accepted on faith. It is,

by design, a GUIDE to be used and supplemented by local inputs to satisfy local educational requirements. Attempts have been made in compiling this guide to anticipate the needs and problems of the school administrator who will decide to adopt the program, the teacher who will implement and operate it and the other school people who will serve the program as support personnel. Success of the program will depend upon these people doing their jobs and will be measured by the success of the students preparing for careers in transportation.

Edwin T. Petrie
Project Director

ACKNOWLEDGEMENTS

This Teachers' Guide was developed by the project staff and the participants at a National Transportation Curriculum Development Workshop held June 1-6, 1972, in Washington, D. C. in conjunction with the United States International Transportation Exposition (TRANSPO 72) using the following procedure: (1) structure, content and objectives were written prior to the workshop by the project staff with the assistance of transportation and education specialists; (2) the writers submitted first drafts; (3) the edited first drafts were reviewed by the writers, advisors and reviewers at the workshop; (4) the writers revised their material into second drafts which were put together and edited at the workshop; (5) continuity was added and final editing was accomplished resulting in the finished product.

PROJECT PERSONNEL

Project Director

Edwin T. Petrie
Division of Vocational Education
Ohio Department of Education

Associate Project Director

Tom Wood
Division of Vocational Education
Ohio Department of Education

Workshop Director

Franklin G. Bouwsma
Vice President
Instructional Resources
Miami-Dade Junior College
Miami, Florida

Conference Manager

Robert H. McCabe
Executive Vice President
Miami-Dade Junior College
Miami, Florida

Editor-in-Chief

Robert F. Mines
Dean of Research and Planning
Miami-Dade Junior College
Miami, Florida

WRITERS

Harold Allen, Chairman
Transportation Department
University of South Florida
Tampa, Florida

William Conway, Vice President
Career Programs
Southwest College
Chicago, Illinois

Virginia Gentle, Assistant
Professor of Television
Miami-Dade Junior College
Miami, Florida

Anne Hayes, Research Associate
Transportation Safety and
Consumer Education
Center for Vocational and
Technical Education
The Ohio State University
Columbus, Ohio

Ernest Jaski, Professor
Merchandising and Marketing
Southwest College
Chicago, Illinois

David Jenrette, Assistant
Professor of Biology and
Physics
Miami-Dade Junior College
Miami, Florida

James Kilbride, Professor of
Psychology
Miami-Dade Junior College
Miami, Florida

Gerald Mellenthin, Assistant
Professor
Business and Data Processing
Department
Harper College
Palatine, Illinois

David Michaels, Professor of
Management
Business Careers Division
Northern Virginia Community
College
Annandale, Virginia

Peter E. Mogensen, Jr.,
President
United Educational Resources,
Inc.
Racine, Wisconsin

Wm. Morton, Jr., Asst. Professor
of Transportation
Institute of Transportation
Travel and Tourism
Niagara University, New York

Marjorie H. Penseyres, Assistant
Professor of Transportation
Institute for Transportation,
Travel and Tourism
Niagara University, New York

Ben Perry, Associate Chairman
Institute of Transportation,
Travel and Tourism
Niagara University, New York

Donald Rathbun, Director
Manpower Research Information
American Vocational Association
Washington, D. C.

Larry J. Bailey, Associate
Professor
Department of Occupational
Education
Southern Illinois University
Carbondale, Illinois

Frank S. Klein, Instructor
Career Exploration Program
East High School
Akron, Ohio

Oliver H. Laine
Aviation Education Specialist
Federal Aviation Adminis-
tration
U. S. Department of
Transportation
Washington, D. C.

Mervin K. Strickler, Jr.,
Director
General Aviation Education
Federal Aviation Administration
U. S. Department of Transpor-
tation
Washington, D. C.

James A. Sullivan, Associate
Professor
Department of Occupational
Education
Southern Illinois University
Carbondale, Illinois

George Ziener, Chief
Instructional Development
Section
Institute for Air Pollution
Training
U. S. Environmental Protection
Agency
Research Triangle, North
Carolina

ADVISORS AND REVIEWERS

Mel Andrews, President
Transport Protective Assn.
Los Angeles, California

John Barrons, Assistant
Superintendent Educational
Operations
Grossmont Union High School
District
LeMesa, California

C. Stanley Bowers
Vocational Counselor
Columbian High School
Tiffin, Ohio

D. K. Miller, Assistant Manager
Personnel Department
Southern Pacific Transportation
Company
San Francisco, California

Mary Jo Oliver
Aviation Education Specialist
Federal Aviation Administration
U. S. Department of Transpor-
tation
Washington, D. C.

John H. Osborne, Vice President
Buckeye Pipe Line Corporation
New York, New York

H. Jackson Darst, Educational
Advisor
Special Assistant to the
Commandant
U. S. Army Transportation
School
Fort Eustis, Virginia

Ronald D. Daugherty, Director
Highway Safety Occupational
Program Development
Center for Vocational and
Technical Education
The Ohio State University
Columbus, Ohio

Philip Hughes, Director
University Research Training
Division
Urban Mass Transportation
Administration
U. S. Department of Trans-
portation
Washington, D. C.

Paul Jansen, Director
Marine Engineers Beneficial
Association School
Toledo, Ohio

Donald V. Keyes, Associate
Dean
Academy of Advanced Traffic
New York, New York

Lt. Commander W. T. Leland
Chief of Training
U. S. Coast Guard
U. S. Department of Trans-
portation
Washington, D. C.

George Lowe, Acting Director
Office of Environmental
Education
U. S. Office of Education
Washington, D. C.

E. Albert Ovens, Dean
Academy of Advanced Traffic
New York, New York

Vernette D. Petrie, Instructor
Social Studies
Old Fort High School
Old Fort, Ohio

Jackson Rogers, General Manager
Nationwide Traffic Service
Bureau
Miami, Florida

Tom Samuels, Manager
General Motors Training Center
Fairfax, Virginia

Jerry Schorr, Director
Cargo Marketing Development
Eastern Airlines
Miami, Florida

James Springrose, Vice President
Transportation
Cargill, Inc.
Minneapolis, Minnesota

Jacqueline Waide, Chairman
Air Transportation Technology
Ohlone College
Fremont, California

Paul McDonald, Corporate Manager
General Motors Training Centers
General Motors Corporation
Detroit, Michigan

Walter Zaharvitz, Executive
Director, National Aerospace
Education Association
Washington, D. C.

Special thanks and appreciation are extended to William O. Hogbin, Education Program Specialist for Transportation and Manufacturing, U. S. Office of Education who served as USOE Project Monitor. His advice, counsel, support and encouragement was invaluable to the project staff.

The project secretary, Faye L. Malone, typed the manuscript through three drafts and the final copy and deserves special thanks for her patience and devotion to the project.

Many other people from both the transportation and education fields freely gave of their time to support, advise and counsel the project staff. To them we also express our appreciation.

TABLE OF CONTENTS

Preface	111
Acknowledgements	v
 I INTRODUCTION TO CAREER EDUCATION	 1
The Need for Career Education	2
Goals of Career Education	2
Career Education as a Comprehensive Educational Program	3
Career Awareness	4
Career Orientation	5
Career Exploration	6
Career Preparation	8
Summary	8
 II INTRODUCTION TO TRANSPORTATION	 10
 III THE PROGRAM PARTICIPANTS AND THEIR ROLES	 13
The Teacher	14
The In-School Vocational Teacher	14
The Vocational Cooperative Teacher	15
The Post-Secondary Preparatory Teacher	16
The Academic Teacher	17
The Student	17
Preparing for Immediate Employment	18
Preparing for Further Education	18
The Parent	19
The Administrator	19
The Counselor	20
The Librarian	21
Other School Staff	21
Industry People	22
Corporation Executive	22
Personnel Director	22
Union Representative	23
The Worker	23
 IV PROGRAM IMPLEMENTATION	 24
Introduction	23
Using the Program	26
In-School Job Training Programs	26
Cooperative Job Training Programs	26
Correspondence Courses	27

	A General Program	28
	Pre-Postsecondary Education Programs	29
V	THE PROGRAM PLAN	34
	Introduction	34
	Overview of Program Objectives	37
	Program Implementation	38
	The Place of Academic Courses in Career Education	42
	Prescribed Learning	43
	Detailed Development of the Program	45
	Lesson Plan Guide	63
	Training Memorandum	64
	Training Plan	66
	Laboratory Assignment	74
VI	GENERAL RESOURCES	79
	Books, Book Lists and Pamphlets	79
	Films and Filmstrips	90
	Periodicals	98

I

INTRODUCTION TO CAREER EDUCATION

Career Education refers to education that is designed to provide experiences to help individuals prepare for, enter, become established and advance in, a self-satisfying and productive career. It encompasses those educational experiences which, beginning in early childhood, develop the skills, attitudes and understanding necessary to successful career selection, assimilation and retention.

Dr. S. P. Marland, Jr., Commissioner of the U. S. Office of Education, has observed that: "Educators must be bent on preparing students either to become properly and usefully employed immediately upon graduation from high school or to go on to further formal education. The student should be equipped occupationally, academically, and emotionally to spin off from the system at whatever point he chooses — whether at age 16 as a craftsman apprentice, or age 30 as a surgeon, or age 60 as a newly trained practical nurse," (DHEW, OE-72-39, 1971, p.3)

In citing the need for career education, Commissioner Marland has referred to it as eliminating the "artificial separation between things academic and things vocational." (Marland, 1971)

It is the fusing of academic, vocational and avocational experiences in a manner which will enable the individual to identify, define and realize personal, social and career related goals.

The Need for Career Education

The United States Office of Education has pointed out that "it is a rare high school that equips all of its students to make the choice upon graduation of entering the job market with a saleable skill or of continuing their education. Too often the graduate has neither option, let alone the opportunity to select one or the other. Nearly 2.5 million students leave the formal education system of the United States each year without adequate preparation for a career. In 1970, ... only about one high school student in six was enrolled in occupational education. More persons are graduating from a four-year college with a bachelor's degree than there are jobs for degree holders. By the end of this decade eight out of every ten jobs in America will not require a baccalaureate degree. More appropriate curriculums must be developed, validated, and installed, and they must be used more realistically if we are to meet the needs and desires of students and serve the purposes of society." (CHEW, OE-72-39, 1971, p.1)

Programs in career education offer a response to this challenge since the fundamental concept of career education is that all education and experiences — curriculum, instruction, counseling — should be geared for economic independence and an appreciation for the dignity of work.

Goals of Career Education

The following Career Education goals are excerpted from a working paper entitled *Career Education: Descriptions and Goals*, which was prepared by the U. S. Office of Education July 29, 1971.

1. To make all education subject matter more meaningful and relevant to the individual through restructuring and focusing it around a career development theme.
2. To provide all persons the guidance, counseling, and instruction needed to develop their self-awareness and self-direction; to expand their occupational awareness and aspirations; and to develop appropriate attitudes about the personal and social significance of work.
3. To assure the opportunity for all persons to gain an entry level marketable skill prior to their leaving school.

4. To prepare all persons completing secondary school with the knowledge and skills necessary to pursue further education or to become employed.
5. To provide services for placing every person in the next step in his development whether it be employment or further education.
6. To build into the educational system greater utilization and coordination of all community resources.
7. To increase the educational and occupational options available to all persons through a flexible educational system which facilitates entrance and re-entry either into the world of work or the educational system.

Career Education as a Comprehensive Educational Program

Career education is a comprehensive educational program which begins in grade 1 or earlier and continues through the adult years. For elementary and secondary education, the program includes a restructuring of basic subjects, grades 1-12, around the theme of career development, including opportunities and requirements in the world of work. The basic academic subjects, such as mathematics, science, social studies and language arts become more relevant because the student is helped to see their relationship to future career goals. In the elementary school, students become aware of the wide range of jobs in our economy, and the associated societal roles. In junior high school students explore specific clusters of occupations through hands-on experiences and field observation, as well as classroom instruction. In senior high school, students prepare for job entry through classroom, laboratory and cooperative education activities or prepare for further education or both. Placement in a job or in further education are options open to all students. At the post-secondary and adult levels, opportunities are provided for entrance and exit at any level, at anytime, in the individual's career development.

Extensive guidance and counseling activities assist the student in developing self-awareness and in matching his interests and abilities against potential careers.

Viewed in this way career education may be described as consisting of four phases:

- Phase I - Career Awareness
- Phase II - Career Orientation
- Phase III - Career Exploration
- Phase IV - Career Preparation

Each of the four phases is described briefly below. The entire career education program is shown pictorially in the figure on the following page. Frequent reference to the figure will serve as an aid to understanding the text material.

Career Awareness

Career Awareness is that stage in the Career Education process at which the child is made aware of self, introduced to the world of work, encouraged to respect others and their contributions to the world of work and stimulated to correlate awareness of self to various occupational roles within the world of work. Career Awareness includes the following basic objectives.

The student will:

1. *Formulate generalizations toward developing a sound self concept.*

By — beginning to consider the ways by which individuals can be described; defining self in terms of these special characteristics; differentiating from others; etc.

2. *Begin to examine the world of work.*

By — formulating general definitions for work; examining a variety of individual occupational roles within the world of work, either vicariously or through some indirect or direct contact; viewing the relationships between interests and work; personal needs and work and leisure activities and work; etc.

3. *Develop a basic respect for others and their contributions to the world of work.*

By — playing a variety of roles designed to encourage empathetic behavior; directing this empathy toward personal thoughts, feelings and activities,

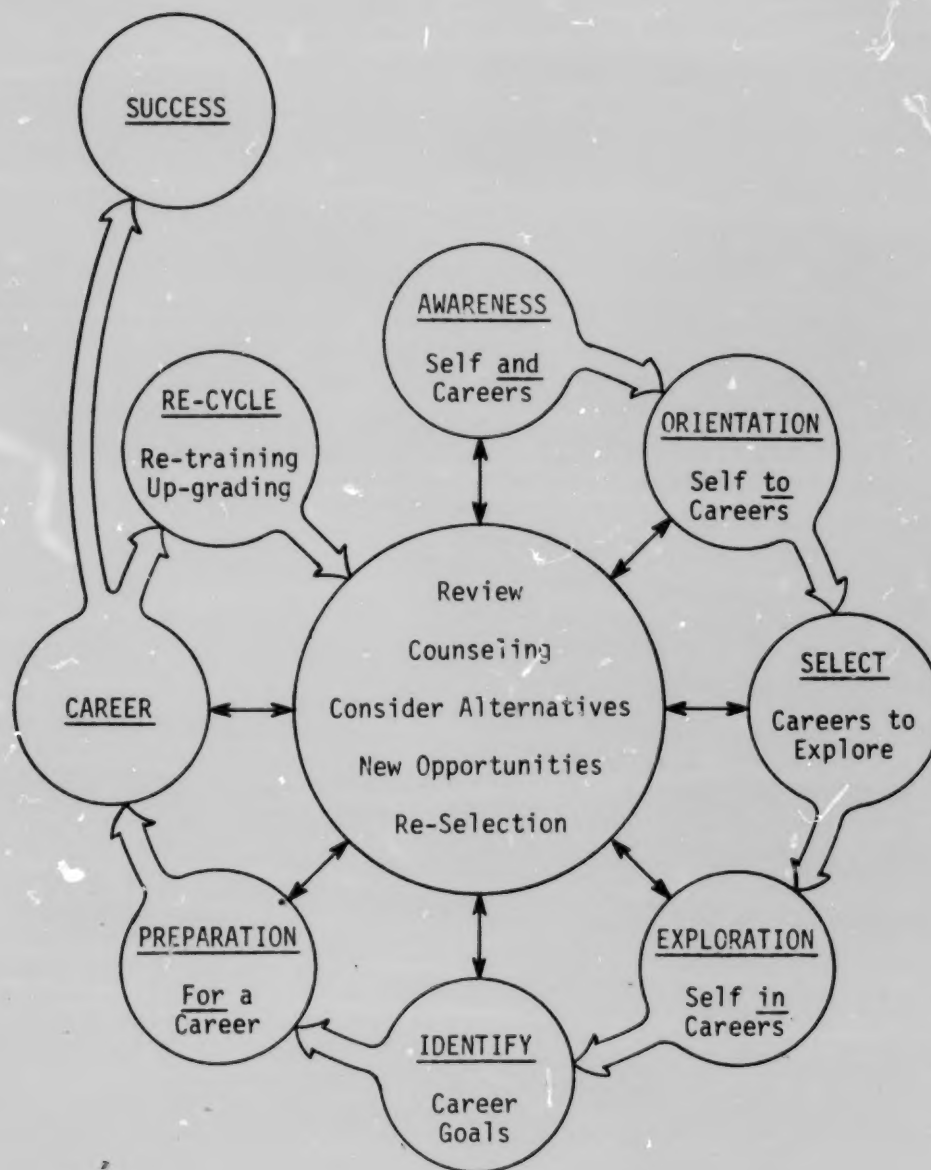


Figure 1 - Career Education Program Model

especially those which are work-related; studying such basic concepts as goods, services, consumers and producers; understanding the basic importance of work in meeting the basic needs of society; etc.

4. *Begin to correlate understanding of self with various occupational roles in order to initiate a motivation toward participation in the world of work.*

By — "trying on" some of the various roles performed by persons engaged in work; considering the ways in which interests and abilities can be considered in determining desirable occupational roles; learning of the interrelationships of various occupations in terms of similarities of skills, functional roles, economic categorization; etc.

The Career Awareness phase is generally referred to as including grades K through 6. However, it should be noted that grade level designations are intended only to indicate the usual or desirable occurrence of each stage in a person's overall development. To provide for individual differences, grade level indications must not be interpreted as restrictive.

Career Orientation

Career Orientation is that stage of the Career Education process at which students clarify the concepts of self and the world of work and attempt to establish a relationship between the two. This attempt to orient self to the world of work (in terms of specific occupational alternatives) is most successfully accomplished through involvement with exploratory behavior in varying degrees. Career Orientation includes the following basic objectives.

The student will:

1. *Clarify self concept.*

By — developing an understanding of the need to begin planning; considering the role of work in individual personality development; evaluating work's role in satisfying physical and psychological needs; etc.

2. *Understand the structure of the American economic system and the interrelationships of its various sub-systems.*

By — understanding fundamental economic concepts and fundamental principles of the manpower market; considering the changing nature of the manpower market, the changing meaning of work, and the relationships of education and training to work; viewing the sub-systems of the American economy at work; etc.

3. *Relate self to the world of work.*

By — understanding the need to plan for participation in the world of work; considering such things as self interests, abilities, aptitudes and needs in relationship to available occupational information; developing individual inquiry and problem-solving skills; etc.

4. *Formulate a tentative plan.*

By — considering desirable occupational roles and requisite education and training; investigating availability of desirable employment and educational and training requisites; integrating various occupational, educational and training alternatives on the basis of desirability and availability; formulating a tentative career plan on the basis of all the above considerations, etc.

The Career Orientation phase generally refers to grades 7-8. The crucial point in the phase comes at the end of junior high school when the student is confronted with the necessity for making an important curriculum decision prior to entering high school.

Career Exploration

The Career Exploration phase of Career Education, characterized by trial and hypothesis testing behavior, is one in which students actively explore real occupational roles. Problem-solving skills are applied to relating the feasibility and appropriateness of self characteristics to the occupational roles being explored and acquiring knowledge of and considering alternate occupational and educational paths. Career Exploration includes the following basic objectives.

The student will:

1. *Exhibit problem-solving and decision-making skills.*

By — recognizing the future implications of various educational and occupational alternatives; exploring various occupational clusters, relating self concepts to groups of occupations and individual occupations via occupational information and first-hand experiences; etc.

2. *Explore various occupational roles.*

By — selecting specific desirable occupations for investigation; experiencing various aspects of specific occupations via simulation activities or direct contact; coping with work tasks and performing in a work situation in a manner reflective of an understanding of the constituent elements of work effectiveness; etc.

3. *Evaluate realities of educational-occupational preferences.*

By — realistically assessing personal (abilities, interests, etc.), social (race, religion), factors which might affect career choice, successful assimilation and advancement potential; reformulating career plans, as well as requisite educational and training considerations; etc.

4. *Reformulate tentative career plan in light of exploratory experiences.*

By — understanding the increasingly critical nature of accurate planning; utilizing problem-solving skills acquired through exploratory behavior to reassess and restructure overall career plan (based upon desired and available educational and occupational alternatives); deciding upon a program of work or education beyond the exploratory phase; etc.

The Career Exploration phase is generally associated with grades 9-10. It is imperative that students be made aware of the increasing importance of planning and become directly involved with activities which will develop the skills and knowledge essential to successful planning.

Career Preparation

Career Preparation is the phase of Career Education during which students develop specific skills, technical knowledge, sound work habits and attitudes related directly to a specific occupation or family of occupations. These are developed through direct involvement in occupational experiences, either within the setting of the school or without. Career Preparation involves the following basic objectives.

The students will:

1. *Prepare to implement a chosen career plan.*

By — searching occupational and educational information and determining appropriate educational and vocational objectives; engaging appropriate available experiences for skill and knowledge acquisition; completing appropriate curricular offerings available; etc.

2. *Obtain initial employment or enroll in appropriate requisite educational program(s).*

By — determining specific occupation (or occupational family) for which employment and requisite education beyond high school (if any) is to be sought; applying, with assistance from guidance personnel, for appropriate educational or occupational opportunity; completing appropriate curriculum requirements prior to job or post high school educational assimilation; etc.

Career Preparation may be secured through a number of differing approaches: high school cooperative programs, correspondence courses, adult education offerings, technical institutes, community and four-year college programs and post graduate university programs. This phase generally refers to the last two years of high school (grades 11-12) and beyond.

Summary

In summary, career education implies a comprehensive structuring of the entire school program around a career development theme. It begins with the development of self-concepts, desirable attitudes towards others and an understanding of and appreciation for work; progresses through orientation to the

world of work, exploration of and preparation for specific occupations; and culminates in attainment of specified occupational goals.

II

INTRODUCTION TO TRANSPORTATION

Basic to the U. S. Office of Education's approach to the development of career education curricula is the occupational cluster concept, whereby occupations are grouped together on the basis of a variety of criterion. Transportation is one of fifteen occupational clusters identified for Career Education curriculum development. Transportation careers could be organized in a variety of different ways: according to mode (air, sea, land and pipeline); on the basis of knowledge and skill requisites; on the basis of commonality of tasks performed; etc. The Transportation Curriculum Project has chosen to utilize the occupational grouping entitled *Intermodal Transportation Careers: A Guide for the Development of Educational Programs*.¹ This publication defines intermodal careers as those where requisite skills are not constrained to one mode or means of transportation, but where job families and a ladder of progression or promotion are built around common skills and knowledges applicable within various modes. Twelve occupational groups have been defined within the area of transportation careers. These are: Data Management Services, Distribution Services, Environmental Services, Maintenance Services, Management Services, Marketing Services, Passenger Services, Vehicle Operations Services, and Vehicle Supportive Services.

Thus, within the intermodal framework a career in Data Management Services as a computer operator might be located within any of the four modes — air, land, sea and pipeline — or include more than one of these modes of transportation, as in the case of a governmental employee concerned with the movement of goods via air, rail and truck from one destination to another.

A thorough analysis of career opportunities in transportation is available in the document *Intermodal Transportation Career Education, An Occupational Cluster Paradigm*,² which contains specific occupational information on hundreds of occupations within the aforementioned twelve intermodal occupational groups. This technical document has been designed as a resource publication for Orientation to, Exploration of and Preparation for careers in Transportation. It was compiled and edited by a staff of transportation and education experts, many of whom continue to serve consultative roles as members of the Transportation Curriculum Project's National Advisory Committee.

The information contained in this resource manual should be used in varying ways, depending upon each student's individual progress. Students who are involved in Orientation to Transportation careers will probably use the technical publication sparingly. As these students progress into Exploration of Transportation careers they will refer to this document first to gain enough background information in order to facilitate making a choice of specific occupational groups to be explored. After students have isolated several occupations or groups of occupations for Exploration, they will supplement in-depth experience-oriented Exploration with the occupational information contained within the technical document. Career Preparation students might use this technical information as a springboard to attaining further understanding of specific occupations via self-directed exploratory behavior.

The efficient utilization of available information is the shared responsibility of teacher and student. A wealth of resources exist. Identification and utilization of these should be fostered throughout the career education process. The remainder of this teacher's guide is aimed at promoting a marriage of appropriate career education objectives with available resources and suggesting means for achieving these objectives through sound use of as many resources as possible. Though documents such as aforementioned resource publications, the Dictionary of Occupational Titles, the Occupational Outlook Handbook, career guidance briefs and others reflect considerable effort and thought in the organizational schemes they propose, students should not be discouraged from developing their own organizational frameworks or fulfilling self-created objectives for Orientation, Exploration and Preparation.

Self initiative is just as vital to each separate phase of career planning as it is to the process as a whole. Therefore, students should be actively encouraged to question organizational schemes and restructure where appropriate. The framework presented

herein for career Orientation, Exploration and Preparation should be viewed more as a compass, pointing our direction, than as a map, defining specific routes. Finding the specific routes to Orientation, Exploration and Preparation should prove as rewarding to students as the end product of the search — specific knowledge about and contact with occupations or groups of occupations. The key ingredients to successful career education are: The development of satisfactory self-concepts and their thoughtful consideration in attempting to define appropriate avenues of investigation and conducting these investigations. Ideally, the exploratory behaviors exhibited by students in their investigation of the world of work and its component parts should be motivated by the desire to learn about themselves and the world of work and, eventually, to achieve successful relationships between the two.

¹*Intermodal Transportation Careers: A Guide for the Development of Educational Programs*, Division of Adult, Vocational and Technical Education, U. S. Office of Education, 1971.

²*Intermodal Transportation Career Education, An Occupational Cluster Paradigm*, Transportation Curriculum Project, Division of Vocational Education, Ohio Department of Education, 1972.

This technical publication is designed to be used as a resource and reference book in conjunction with this teacher's guide. Constant reference to it will be made in the following chapters.

III

THE PROGRAM PARTICIPANTS AND THEIR ROLES

The success of any program in preparing students for careers in transportation depends upon a great number of people assisting the students in achieving their learning objectives. The students themselves have an unusual role, and their parents, the school staff, people from business, industry and the community must assume definite roles to provide this assistance. One of the primary tasks in a career preparation program is to coordinate the roles of all the people with which the students come in contact. The purpose of this chapter is to provide a description of each of these roles and a guide to their coordination.

Most of these roles will be unfamiliar to the people who will assume them. The big job will be to see that they become familiar with the things teachers and students will expect of them. The better each participant understands his role, the more smoothly the program will run.

The following descriptions are written in a general way. They may be used as they appear or revised for adaptation to local needs. One idea for informing participants would be to provide each with a brief written description of his role as the program is initiated. This would provide advance information that may be reviewed immediately prior to actual student contact.

THE TEACHER

In career preparation, the teacher works with two kinds of students: the student preparing for immediate job entry and the one who is preparing for further education. Since any program which represents the culmination of a number of steps in career education will necessarily find students with widely varying goals, career interests and career expectations, the teacher will be required to make frequent shifts in discussions with students.

It is especially important that the teacher allow the student to make many of his own decisions and to direct many of his own activities and also to experience a certain amount of failure. (Just as he will in his career.) Similarly, other people contributing to the program must have the freedom to initiate, to experiment, to both succeed and fail. In order for others contributing to the program to evaluate what they are doing, teachers must provide considerable feedback to them about what is happening within the program generally. The other participants must have the necessary information to allow them to evaluate their own efforts; it is not enough that in his role as a coordinator the teacher will conduct evaluations; information about these evaluations should be shared with all other participants so that they may conduct meaningful evaluations of their own activities.

It will be necessary for all teachers to exercise considerable flexibility in programs of career preparation. The teacher must not only be prepared to exercise this flexibility in his or her own role, but in addition, will work with a wide variety of others who must also be allowed a real degree of flexibility in how they help the student achieve his career preparation goals.

Listed below are role descriptions for four (4) different kinds of teachers who will be involved in career preparation. Though they differ, many parts of their roles are similar. Depending upon the size of the school these may be roles of individual teachers or a single teacher could combine any, or all of them.

The In-School Vocational Teacher

Because career preparation represents the culmination of the career education process, the role of the vocational teacher here is of exceptional importance. Primary emphasis is placed upon the students' acquisition of skills. The in-school vocational teacher will have the responsibility for much of this skill training.

Within the secondary school, the vocational teacher must meet certain state vocational certification requirements. Normally he, or she, will be required to have obtained appropriate work experience in the vocation involved as well as a considerable amount of college teacher education. This combination is to be preferred, since it provides the teacher with the most appropriate background relating to the role that he, or she, will now assume. It also means that the teacher will have the peer recognition both within the school and community that is necessary to make the most effective contribution to this kind of program.

In order to be really effective, the in-school vocational teacher must also have close relationships with employers in the field for which he is preparing students. The vocational teacher must maintain ties with industry and the community at large that will be helpful in obtaining materials, equipment, information and most important of all, placement assistance for graduates of the program.

The in-school vocational teacher will serve as a manager of the educational program; as a coordinator of the activities of others who will be contributing to the program; as a liaison between and among students, parents, counselors, faculty, administrators and the community; and as an evaluator of the on-going program as a whole and of its various components.

The Vocational Cooperative Teacher

The teacher-coordinator of a cooperative vocational education program is usually given the total responsibility for coordinating the on-the-job training and in-school related instruction of a group of students preparing for careers in a single occupational group or in a single cluster such as transportation. Smaller schools may combine more than one occupational group or more than one cluster in a class to make the program economical to operate.

One of the major roles of the teacher-coordinator is placing the students in on-the-job training positions and assisting them in adjusting to their work environment. The teacher must enlist participation of cooperating employers and maintain good relations with them. Students will require assistance in preparing for job interviews, dealing with job problems and evaluating job training progress. Since the teacher-coordinator cannot be on the job with the student, he must train and place considerable trust in on-the-job training supervisor.

While the in-school vocational teacher normally has a class where all students are studying in a single occupation, the teacher of a cooperative program usually has students in many occupations. The teacher-coordinator must be flexible enough to coordinate and correlate his in-school related instruction with each student's on-the-job training. He must encourage the students to accept a certain amount of responsibility for their own training and then depend upon them to do it.

The vocational cooperative teacher also will serve as a manager of the educational program; as a coordinator of the activities of others who will be contributing to the program; as a liaison between and among students, parents, counselors, faculty, administrators and the community; and as an evaluator of the on-going program as a whole and of its various components.

The Post-Secondary Preparatory Teacher

Larger high schools will no doubt provide a post-secondary preparatory course in transportation for those students whose career choice includes a decision to pursue further education after graduation. Some schools may establish a program with both pre-postsecondary and vocational students doing their career preparation in school, on cooperative jobs or both. Smaller schools may even combine transportation with other clusters in a general post-secondary preparatory course.

This means that the teacher assigned to this program needs to have a varied background. Since the students will be preparing for post-secondary education, the teacher should have had post-secondary education. The fact that the program is career oriented means that the teacher needs to have had practical work experience in the transportation cluster as well.

Since students in this type of program will be desirous of pursuing a variety of different careers it will be necessary for this teacher to make extensive use of all individualized instruction techniques. Students will need direction to initiate an individualized learning plan by selecting objectives and planning activities and experiences necessary to meet their objectives. It will also be necessary to assist them in carrying out the plan. The teacher's greatest assistance to the students will be in helping them interpret their experiences to see if the intended objective has been met. It will probably also be necessary to coordinate a number of students' experiences to see if they may be done together, in groups, to conserve time and resources.

The Academic Teacher

One of the basic goals of career education is to restructure our educational system by focusing all subject areas around a career development theme. This implies a definite role in career preparation for teachers of the language arts, sciences, mathematics and social studies. To assume this role the academic teacher must abandon teaching only in the abstract and move toward an emphasis on practical application. This will enable the student to find meaning and relevance not only in preparing for a career but in all of his other school work as well.

The academic teacher assumes this role by cooperating with the career preparation teachers in such things as observations, joint assignments, providing practical examples, etc. For instance: A written report could be both a career preparation and an English assignment with both teachers assisting the student; an assignment in metal machining and coolants could be done in conjunction with a science project in chemistry and metallurgy; the speech teacher may assist with oral reports the student may do in conjunction with their career preparation to pass information to other interested students; and many practical examples from transportation can be provided for mathematics classes.

THE STUDENT

The students are the primary focus of the career preparation program in transportation. These students will be classified into three categories within career preparation. Some students will be preparing for immediate employment when they leave the high school. Others will be preparing themselves for further training at the professional or technical level. Some may be doing both.

The student must be the most active person in the entire career preparation process. He is not only involved in building career skills; he is also active in decision-making, program planning and making contacts that will extend his knowledge of the particular area of transportation for which he has chosen to prepare. His program will take him out of the school and into the industrial and business communities. In this capacity he serves as a representative of his school among various community groups and should be encouraged to conduct himself accordingly.

The crux of the student's role is that in career preparation he is an active learner assuming considerable responsibility for his own education. He receives guidance and instruction, but to a great degree follows through on his own and is capable of initiating activities directed toward his goals, whether they be job entry or further education.

Preparing for Immediate Employment

The student who is preparing for employment when leaving high school will be enrolled in a vocational program (either in-school or cooperative or a combination of both) along with a program of both technically related courses and related courses of a general nature. In keeping with the goals of career education all of these courses and programs will be centered around a career development theme.

This student has made a decision to enter the world of work and should be willing to study materials, participate in activities, gain experiences and complete assignments toward this end. He will be interested in obtaining job skills and career related information and he should be willing to proceed on his own with only a few general directions from teachers. He recognizes that his success, partial success or failure will depend primarily upon himself and the strength of his commitment to his career goal.

Preparing for Further Education

The student preparing for further education will spend less time on in-depth skill training and concentrate on technical and general courses related to the career he has chosen for further study beyond the high school. Again, these courses will be built around a career development theme.

This student has chosen further education and should assume a great deal of responsibility for his own preparation. He will not wait to be told exactly what to do and how to do it. He will take a minimum of direction and then follow through on his own using his already acquired learning and research skills. Just finding out is not enough for this student. He is a questioner seeking additional information, more data or better verification.

THE PARENT

Parents should help their children work toward becoming adults by providing them with considerable positive reinforcement. Preparation for a career in the world of work or for further education provides parents with a golden opportunity to support and encourage their high school age children toward self-sufficient maturity. Too frequently the school tends to overlook these roles and treat parents as "figures in the background" of the educational process. Parents should be encouraged to become involved as an integral part of the career preparation program.

The parents should have been involved in their children's career exploration program to the point of assisting and encouraging them in their career choices. A choice to prepare for entering the world of work when leaving high school should be reinforced just as positively as a choice to go on to further education.

Parents should aid in career preparation by providing a good learning environment at home. Parents should strive toward loving, sharing, supportive, confidence-inspiring relationships with their children to provide a tension-free atmosphere that is conducive to productive study and achievement. Physical facilities necessary to aid in home study should be provided. This can be done by providing a desk area, bookshelves, etc. It might even include releasing the TV set to them when a program related to careers in transportation is being shown. Even turning the TV or radio volume down or completely off should be considered if the student must study nearby.

THE ADMINISTRATOR

The administrator's primary role in preparing students for careers in transportation is to combine local goals, resources, facilities, and personnel into the best possible programs for the students. Generally the principal is responsible for the implementation of all programs and projects in a school. He has responsibilities for curriculum in addition to his supervisory and other roles. Most principals find themselves involved even though their other duties prevent them from having a regular class schedule.

A principal has several important roles to play, not the least of which is that of program implementor. The decision to implement new programs is usually made by the principal who is responsible for setting the climate and tone for curriculum adaptation and change.

The principal also fills the role of a facilitator. New and innovative programs often come into conflict with established programs and procedures. In his role as facilitator, the principal works to avoid and to ultimately eliminate this conflict making each new program in transportation career preparation a successful addition to the curriculum.

The role of evaluator is most important for the administrator. As career preparation programs in transportation develop and proceed they will require evaluation by the administrator. Should the program be expanded or curtailed? Are the personnel adequate to the tasks involved? Are the students making reasoned career decisions? Is the rest of the school staff evaluating the program from their point of view?

THE COUNSELOR

The counselor is in a unique position to aid both students and teachers in transportation career preparation because he, or she, has responsibility for all of the career, job placement and post-secondary education information in the school. The responsibility for these things indicates a number of roles for the career counselor.

The career counselor will function as a job placement officer or, in large schools, he will supervise a full-time placement person. This role is quite important to those students who will be seeking employment after completing a career preparation program and leaving school. He will also be concerned with part-time employment of students and will assist vocational cooperative teachers in obtaining training stations for their students. The counselor should maintain direct community contracts, through professional organizations and the like, in addition to receiving information from teachers and others.

The student preparing for further education will need the career counselor in making important decisions regarding future education or training. The counselor should have information about entrance requirements, tuition costs, types of programs, etc.,

available in a large number of schools. In addition to colleges, junior colleges and technical schools this should include training that large corporations might have as part of their internal training programs, proprietary and correspondence schools.

The career counselor will also serve as a personal counselor and also aid teachers in what personal counseling they must do. Students participating in career preparation programs will no doubt have personal problems. Counselors can and should assist the students and, as they become involved, teachers and parents in resolving misunderstandings that may arise. An important information theory axiom states that all communication is only partially successful — there are always those who do not receive important information or those who misunderstand information that is received. Misunderstandings can lead to problems and the counselor, as a concerned third party, can help to resolve the difficulties. The teacher should use his services and encourage students and their parents to do the same.

THE LIBRARIAN

The librarian can be especially helpful to students preparing for careers in transportation. In most schools what used to be called the library has become the learning resources center. This suggests more than just books and magazines; it includes records, tapes, films, filmstrips, etc. The librarian can also order materials for you if asked, can set up special displays, and can set aside and reserve materials for students.

The services of the library, or learning resources center, will be particularly helpful to the vocational cooperative and post-secondary preparatory student because of the large amount of individual study necessary in this area.

OTHER SCHOOL STAFF

In addition to the persons mentioned specifically there are others in the school who are important to career preparation. These are such people as the secretary, registrar, custodian, assistant principals, bus drivers, etc. Although they may not be charged with any specific responsibilities with regard to the

career preparation program they are required to support all school programs. As good team members, they should be willing to cooperate with you whenever possible.

INDUSTRY PEOPLE

Many corporations and organizations should have contributed major efforts to the setting up of career preparation programs in the school, both materially and as advisors. They will continue to do so as long as they see a successful program. They play especially vital roles, since their help and information comes directly from industry itself. While all aspects of business and industry, including labor-management relations or union negotiations, should be studied in career preparation programs, highly controversial or emotional issues might be best left alone, if only to prevent the student's attention being sidetracked from the matter of preparing for a career. Some important business and industry people and what they contribute to the program are listed below. Persons responsible for implementing career preparation should consider appointing at least one of each to the advisory committee for each program.

Corporation Executive

This man can best be used to obtain general information. He knows the overall operation of business and industry, their problems, their future and the relationships of his own firm to other industries. He also has the authority to provide access to certain requested areas in his business and to see that the best treatment is received. The corporate executive will also be useful since he usually is well known in the business community and can exert influence with companies other than his own.

Personnel Director

This person and his staff of assistants can explain how many workers are employed in different jobs, what their salaries are, and the skills, aptitudes, and attitudes necessary for employment and promotion. The personnel director can also make predictions of job openings for the future; he can recommend the best preparation for employment in his company. His office should also be able to provide sample job applications and interview forms for use in career preparation programs.

Personnel directors can be particularly helpful to teachers of cooperative education programs, both vocational and pre-postsecondary. These are the people who do the hiring for their company and many times can help to create part-time on-the-job training stations.

As with the executive, the personnel director is in contact with companies other than his own and can provide information on available job stations in other plants.

Union Representative

Contact with union people should give the student a different viewpoint from that of industry management. Teachers and students should use not only the representative who is an employee of the union but the steward who is also a worker. This is usually beneficial to the student, since it will give the student a broader view of labor-management relations than might otherwise be the case.

The Worker

These are often the most difficult people to see and talk with because their primary responsibility is transportation and getting the job done, not instruction. However, they have the most direct, specific, and current job knowledge. They are at the action level of industry where people get their fingernails dirty.

In the case of cooperative, on-the-job training type career preparation programs these are the most valuable industry people to work with. These are the people who will directly train and supervise student workers. When a student works with and learns from a truck driver, ticket agent, mechanic, stewardess, or other worker, he is working with someone doing the same thing he may be doing within the next five years. From the student's viewpoint, these contacts are among the most valuable of all.

IV

PROGRAM IMPLEMENTATION

The overall purpose of this chapter is to provide basic information about career preparation in transportation to teachers, administrators, counselors, and others concerned with career education. Career preparation is the third of a three part program of Intermodal Transportation Career Education for the high school.

Concise as this chapter must be, it is nonetheless intended as your guide to establishing and conducting career preparation programs in your school. This does not mean that it in any way reflects what should be an inflexible program. This guide is meant to be a resource, a place to find practical, useful information and ideas, but is not intended as a substitute for your own good judgment. As a teacher, you will find that you are the person best qualified to determine how to attain your objectives.

On the other hand — and as is true with every facet or level of career education — Transportation Career Preparation is not an assignment for one individual. In fact, this is probably more true of career preparation than of any other level of career education. Activities of the student should take him into corporation offices, onto job sites, into the counselor's office, into the library. In undertaking any career preparation program you as a teacher need the support of industry executives and supervisors, personnel officers, training officials, rank and file workers, union representatives. This is a program for which your role will be that of both teacher and coordinator.

In Transportation Career Preparation, the program objectives involve qualifying the student for an entry level position in the transportation industry or preparing him for further training beyond high school or both.

It will be apparent from the foregoing statement that this is career "preparation" in the truest sense of the word and to many students will represent the culmination of the career education process. While these students may be involved in a career education continuum throughout their lives, this is where the preparation for a career is most emphasized, focused and intensified.

Prior to entering this phase of career education, the student will have evaluated his own interests, abilities, values and needs as they relate to occupational goals. Should the student not have dealt with these matters to the extent that he requires, career preparation will have as a major objective bringing him up to the point where he actually can handle career preparation opportunities; and then involving him with activities of that kind. Whatever elements he may have missed in prior phases, the goal of this phase is to qualify the student for an entry level position or further training at the professional or technical level, or both.

In addition, an overall objective of career preparation is to provide the student with an overview of the national transportation system and its impact on our national economy, as well as upon such important facets of our national life as the environment and our social and political systems.

Since the student may not remain in the particular facet of transportation represented by his entry level job, a further objective of career preparation is to help him understand the broad aspects of the United States transportation system, the wide variety of career patterns involved with it, and the interdisciplinary basis which he may ultimately use in firming up his career objectives.

The transportation field is so broad and complex that it provides employment opportunities for people ranging from unskilled workers to the most sophisticated professionals. Because of this and the size of the industry, it is very likely that almost any school providing occupational education programs will be providing career preparation opportunities appropriate to transportation. Of course, circumstances vary from community to community and from school to school, and decisions concerning transportation career preparation must be made by each community, in the light of its needs and its own particular educational structure.

USING THE PROGRAM

The program outlined in the following chapter is intended to be used in a number of ways: (1) As related information for in-school job training programs, (2) As related information for the in-school portion of cooperative job training programs, (3) As related information to be used as a self-study supplement for a correspondence course in skill training, (4) As a general program for students who will go to work in transportation after high school graduation, and (5) As a pre-postsecondary course for students who will obtain career preparation in transportation after leaving high school.

In-School Job Training Programs

This type of program is appropriate in places where demand is such that 15 to 25 graduates with training in one job family can be employed annually. In-school programs require considerable investment in facilities and equipment and placement of large numbers of graduates is necessary to justify this investment.

In-school job training usually requires that a student spend 3 to 4 1/2 hours per day for 1, 2 or 3 years prior to high school graduation. This time is spent in a combination of laboratory-shop experiences and related study in the classroom. Information and activities contained in the program guide is intended for use in related classes of programs of this type, as well as others.

For example; a student may be studying in a job training program for data processing with the intention of seeking employment in the occupational group of transportation data management services. That student may study the transportation career preparation program guide as related material while other students in the same data processing course are studying related material in other clusters. The program guide may be used as related just as well by a whole class studying diesel engine mechanics.

Cooperative Job Training Programs

This type of program can be appropriate in practically any school-community situation. Each student in a cooperative program has an individual training plan with on-the-job instruction making a wide variety of possibilities available. The built-in flexibility of the program allows for anything from a whole class

of students training in any number of transportation job families to a whole class of students training in job families from all fifteen career education fields.

A cooperative job training program is defined in Part G of the Vocational Education Amendments of 1968 as:

"...a program of vocational education for persons who, through a cooperative arrangement between the school and employers, receive instruction, including required academic courses and related vocational instruction by alternation of study in school with a job in any occupational field, but these two experiences must be planned and supervised by the school and employers so that each contributes to the student's education and to his employability."

The student is usually required to spend 1/4 of his school day in academic courses, 1/4 of the day in related vocational instruction and 1/2 day in on-the-job training experiences. The beauty of this type of program is that the teacher need not be an expert in any one occupational area. The trade experts will be handling on-the-job portion of the program.

Students and teachers may use the program guide and select activities and experiences to study in the vocational related classes. This related class time may also be used in supervised study of a course from an accredited correspondence school. (See the following section.)

Correspondence Courses

Whether formally supervised in school or used at home, correspondence courses should become an integral part of practically all transportation career preparation at the high school level. This is especially important because correspondence study is an excellent, relatively inexpensive way to add career preparation vocational and technical programs to your school's curriculum.

Many public schools in the United States do make use of in-school supervised correspondence study. Earlier in this chapter the various methods of using this type of career preparation were pointed out to you. This section will indicate how your school might also get started in the program.

Your first efforts in this regard should be to write the National Home Study Council at 1601 - 18th Street, N.W., Washington, D.C., 20009. The National Home Study Council was founded in 1926 through the cooperation of the Carnegie Corporation and the National Better Business Bureaus and has been working toward the upgrading of home study ever since. The Council established an independent Accrediting Commission in 1955 that was charged with determining whether correspondence schools who applied for accreditation met the council's established educational and business standards. In 1959 this Commission was recognized by the U. S. Office of Education as a "nationally recognized accrediting agency."

Approval of a school by this Accrediting Commission is an insurance of excellence which students, teachers, counselors and administrators can accept with confidence. Schools that have received accreditation are listed in a Directory published by the council annually and updated every six months. The Directory is available free from the Council as are a number of publications, including *The Role of Home Study Today; Accreditation, What it Means, How It Works; A Counselor's Guide to Home Study Training and Supervised Correspondence Study*. When writing you should obtain a special list of schools who specialize in supervised correspondence study.

Many schools specialize in "custom built" programs of supervised correspondence study for high schools, while others indicate that their courses may be used in this way. Some schools furnish complete training programs and others advocate the small unit approach so that individuals may put together their own program. Costs vary widely according to type of instruction, program materials, time to complete, tools and kits furnished, etc.

If you are contemplating correspondence study for career preparation in transportation, you are urged to make use of the National Home Study Council Materials. The Directory will lead you to schools offering the programs you desire. Write them, compare their offerings, and choose the training programs that best suit the needs of your students.

A General Program

The program outlined in this guide should not be overlooked as a possibility for training students who will go to work following high school graduation. Several alternatives exist for using this program in building job training courses.

The program could be offered on either a whole class or an individual basis. Concurrently, with taking this program, the student could engage in a number of activities to obtain transportation job skills:

1. Intensive study of one of the occupational groups (or a job family within an occupational group) with released time from school to obtain field experiences.
2. Study of one occupational group in conjunction with supervised correspondence study to obtain specific job skills.
3. Other possibilities limited only by available resources and the imaginations of the teacher, student and counselor.

Pre-Postsecondary Education Programs

There are two conditions relating to your school situation which will greatly influence your pre-postsecondary program for transportation careers:

1. The number of students in your school who have completed career exploration and who continue to maintain their interest in transportation careers.
2. The programs and training facilities available to prepare students for entry-level positions in transportation.

The goal of this preparatory program will be to create a foundation for the student upon which post-secondary career training can be built. Thus, the cumulative knowledge achieved by the student will be helpful when applying for an entry-level job in transportation. Backing up the program should be a strong, related learning program which will further equip the student for a job or orient him to additional training. Part of this program might be a provision for letting the student take one or more correspondence school courses related to career objectives.

An important point to remember: If you have students who have completed the career exploration phase, your school has some obligation to provide them with continuation of that program. How your school will discharge this obligation depends on such factors as these:

1. The number of students to be involved and the strengths of their commitments.

2. The willingness and capability of your school to undertake any new project in terms of procedures, supplies, facilities, and so on.

3. The availability and interest of a capable staff member (teacher or counselor) to coordinate program activities.

4. The support of representatives of the transportation industry in your community to work with school staff and interested students.

Although these factors are largely interdependent, the size of your student population (most particularly, those interested in the program) will determine what you can offer. The ideal educational situation would be to offer transportation career preparatory programs to any number of students from one person up.

In many school systems fifteen is the minimum class size. With less than the minimum number there are two directions possible:

1. Offer an individual study program for one or two students working on their own; at regular intervals they would work with the guidance counselor and/or a community representative.

2. Combine students from other career fields into one integrated class; another solution would be to offer the program on alternate semesters or when there are sufficient numbers of students to justify it as a teacher-run program.

It must be recognized that the very uniqueness of this program will sometimes slow its progress. This is not because teachers have a great resistance to attempting something new (although that may be part of it), but because the persons involved may be uncertain of how to manage the program and therefore afraid to make mistakes which will make them feel that they are not doing the job they would like to.

This normal reticence about attempting something new can be met in two ways: First, you must assure the teacher that he is taking on a special assignment different from what he has previously been doing. Since it is different, there is the need to change teaching styles and take risks. Secondly, you should try to involve a teacher who is willing to try something new and different. (Should you be the teacher involved, these are important points for you to recognize and deal with honestly on your own.)

The behaviors of the teacher in this program are extremely important. Ultimately all educational innovations fail or succeed in the classroom; a large part of this success or failure has its basis in teacher attitude. The teacher must be willing to look at instruction at least a little differently; he must think of himself as the classroom manager rather than as the "teacher." Expressed in negative terms, the teacher's creed must be to not do for his students what they can best do for themselves.

The student will have many opportunities for individual study in the standard classroom. No laboratory facilities are absolutely required but your students may use existing ones on a short-time basis. You can, and should, make use of audio-visual materials involving equipment generally available.

This does not mean that the student will be isolated or working in a vacuum; what he learns in this class should be reflected in other school work and vice-versa.

Integrating the preparatory course in transportation careers with other parts of the school curriculum and the work of the counselors will cause some problems to arise. We can blame some of these problems on resistance to new ideas and methods, more accurately, much of it will probably be due to a reluctance to "do something not as well as previously." From an administrative viewpoint, integrating any programs can be a slow process — there are very few successful interdisciplinary programs — but any success is better than none.

There are two general approaches toward such changes which are especially worth mentioning here and they usually work best when used concurrently. One is the informal approach over coffee, lunch, and after school in which administration and staff discuss their needs and viewpoints. The second way is through a formal structured program of change.

Regarding the latter, formal techniques would include:

1. After reviewing academic, vocational and counselor lesson plans, the administrator might recommend specific activities leading to coordination of the programs.

2. This involves identification — identifying each of your student's teachers and counselors and sending them a memorandum beginning: "You will be interested to know that (state names) have enrolled in our pre-postsecondary program in transportation which has these objectives..." and ending with "...anything you can do to help these students work toward these objectives will be greatly appreciated."

3. To involve counselors, encourage your students to include this sentence when writing to various sources for transportation career information: "I would also appreciate it if you would send an additional copy to my guidance counselor whose name and address are given below." Send a carbon of the letter to the counselor.

4. At each appropriate faculty meeting mention the program's current activities. (Caution: Make the announcement relevant and brief.)

5. Most schools have a faculty curriculum committee whose task is to improve the school's over-all program; identify your representative and submit recommendations or a request that you be allowed to participate.

The above are formal techniques for helping develop interdisciplinary aspects to your program; informal approaches are useful, too, but some persons have more luck with these than others. If you are the sort of person who starts sentences in the following ways you might well be very successful with informal approaches:

- "Can I help you with...?"
- "Do you think you would like to...?"
- "Of course, any of your students are welcome to come by to..."

Again, the importance of the teacher coordinating the program is very obvious. If your school does not have someone who is a qualified transportation expert you might consider forming a three-member team; teacher, counselor, and community transportation expert. The teacher would have the day-to-day classroom responsibilities but would depend to a large extent on the advice and suggestions and expertise of counselor and transportation expert. An advisory board with community representation can tremendously help the growth of the program.

Evaluation of the program is an additional, important step. Think in terms of two kinds of evaluation: process and product. In terms of process evaluation, review what you did in terms of procedures: Would you change your schedule or would you select different materials? Product evaluation should be thought of in terms of the program success: Are your students still interested in careers in transportation? Have they set up schedules for post-secondary training?

The overall goal of evaluation will be to measure success and provide a technique for continual program improvement.

With your ongoing program, there will be highly important factors to consider other than those cited here. But these can provide the kind of basis you will require in initiating this type of program.

V

THE PROGRAM PLAN

The Model and program plan presented in this chapter are intended to be used as a guide by administrators and teachers in planning lessons and learning encounters between students and a stimulating learning environment. Teachers, counselors and others who are involved will, ideally, work in groups to assure that local concerns are met and that local resources are used to the best advantage. This includes planning and executing daily lessons, ordering relevant films and materials, planning field trips and assuming responsibility for particular phases of the model in the preparation phase to assure continuity of student experiences and accomplishment of the stated objectives.

For education purposes, *Career Education* is defined as the total effort of the school and community to integrate individuals into society in productive and self satisfying occupational pursuits. Primary in the definition are the words "productive" and "self satisfying." The school facilitates career education by systematic intervention during the learning process to insure that students are confronted and successfully cope with the major developmental tasks necessary to mature vocationally. *Vocation* may be thought of as a personal calling toward a particular type of work in a career. *Occupation* refers to a cluster of related jobs. *Jobs* are defined as consisting of one or several paid work assignments. *Vocational preparation* refers to mental and physical activities which are engaged by the student in a purposeful way to foster or develop occupational competence. In this sense, vocational education and occupational education are related in that developing skills applicable to one or to several transportation occupations, for example, may prepare a person for his larger vocational goal or

calling. Typically it consists of learning activities, practice trials and terminal performance of work tasks in vocational shops which prepare the individual to complete the greatest number of paid work assignments, usually at the entry level, at a prospective place of employment. Cooperative arrangements with employers for on-the-job training and instruction are also applicable and implicit to the definition, as well as placement before or after graduation, and follow-up. Other less direct though equally effective methods for preparation training are also available, including supervised home study and systematic training in a variety of segments of the transportation cluster through regular academic classes. The four programs by which the student may prepare for employment in the transportation cluster, then, are: (1) In-school Job Training Program, (2) Cooperative Job Training Program, (3) Correspondence Home Study Course (school supervised), and (4) The General School Program. In addition, the student may prepare for post-secondary transportation career preparation by taking a pre-postsecondary course based upon this program in conjunction with any or all or none of the four preparation for employment programs.

Primary to the success of each of these programs of instruction are school personnel who understand the needs of the student and are motivated to action. Simply stated, teachers and others must be capable and willing to help the student clarify career choices and formulate realistic career plans, expose the student to an appropriate learning environment by setting the conditions of learning, and then stay with him through job placement and work entry. When teachers and counselors are competent and care about consequences associated with discharging their professional responsibilities, students succeed. When either of these ingredients is missing, results are inconsistent.

This program plan emphasizes the individualized learning module as an appropriate strategy to direct learning. It is suggested primarily because it presents the student with a consistent learning format giving several options in learning selected material and job related skills tailored to individual needs. Needs are determined by competent teachers and counselors in concert with students and parents and then learning prescriptions are written which best seem to satisfy the circumstances, the people involved and selected program of learning. This method allows great flexibility in instruction and permits the student to be exposed to a variety of teachers and others who might give instruction; for example, para-professionals, employers and counselors. It also gives the student the option to change programs of instruction; for example from supervised home study to the school based option, without penalty. Finally, the learning module insures that the learning prescription is carried out, even at a later time by

someone unknown to the teacher or counselor, since the standard format prevents exclusion of important material.

This does not preclude the use of large group instruction, small group instruction, individual counseling sessions and other accepted methods of teaching; particularly where students are grouped in classes by purpose, similar interest, career objective and vocational specialty, such as in an automotive mechanics class. Where all students are to be exposed to the wide array of job opportunities and commensurate educational possibilities, for example, sound films are very effective to convey selected information uniformly and efficiently.

The individualized learning module approach, however, is the most effective means to guide learning when prescriptions are written for specific students pursuing personalized career objectives that are derived from their individualized needs in keeping with tentative or revised career plans.

Teachers charged with organizing and managing career preparation instruction are faced with three primary tasks: They must

1. Specify objectives to be accomplished stated in terms of student performance,
2. Design activities for the student to engage which will give the opportunity to learn the objective specified, and finally
3. The available time must be divided into lesson and learning encounter periods, in sequence, so that learning proceeds smoothly and efficiently.

This activity should be engaged in workshops designed to plan programs of varying lengths for students pursuing either options in one or more of the four programs sponsored by the school.

The objectives specified for a particular student constitute the basis for writing the individualized learning prescription. That is, the teacher or counselor is charged with writing a training plan, jointly with the student, which accomplishes career related objectives taken from the tentative career plan. A desirable side effect generated by keying off of the tentative career plan is that the student may, in fact, reject unrealistic tentative career choices as well as affirm others during the learning process. This is in addition to the primary purpose of accomplishing the specified objectives by mastering the stated performance. The outcome should be the formulation of a revised career plan, more consistent and in keeping with reformulated needs.

OVERVIEW OF THE PROGRAM OBJECTIVES

During the career preparation phase, learning experiences sponsored by the school should focus on having the student implement enroute or immediate career plans through appropriate course work and specific job preparation and placement. Students entering career preparation, after successful completion of career exploration, should have successfully demonstrated the ability to formulate tentative career plans. That is, they can formulate career plans which they have some commitment and which fulfill personal needs and societal demands. These career plans must also be realistically attainable using the available means which are determined as being appropriate by professionals in the school who are responsible for preparing youth for entry in one of the many transportation related occupations.

When beginning career preparation, the student should narrow occupational specification by eliminating those alternatives which are less probable, unrealistic and hold little promise for personal fulfillment. This may require a variety of experiences that are; (1) designed to eliminate discrepancies between held beliefs and the reality of work in specified transportation occupations, and (2) necessary to vocational preparation for entry in the labor force. The student may actually try several work situations in the cooperative education program as an employee in the community with a participating employer under an approved arrangement with the school. For those whose realistic career plans specify an enroute plan, additional technical subjects which incorporate learning modules related to selected transportation occupations, and which are requisite to post-secondary training, should be prescribed, scheduled, completed and evaluated on an individual basis.

The student who anticipates direct entry into the labor force upon graduation should engage specialized training provided by the school as soon as possible and wherever it is available: in school shops and laboratories, using the cooperative education program, through other school subjects, and even at home using the supervised home-study program of learning. Individual responsibility for each student should be assigned to a professional staff member or teacher, preferably to one who by his own life style and example presents an appropriate adult model to be imitated by the student. For those who still plan to attend post-secondary schools, increased emphasis should be attached to requisite subjects and additional in-depth exploration in the transportation cluster to refine the tentative career plan. The general school program and subjects without attached occupational significance

are to be avoided, lest the student take lightly the mission and responsibility of the school and his own obligation for self actualization in useful work. Summer employment in professional, technical, semi-technical and other work should be encouraged and sought by the school so that the student may use this means to clarify misconceptions, resolve misgivings, and strengthen commitments to previous decisions.

The career plan should be continually evaluated en-route to assure that the student will attend to the task of preparing for entry into the labor market or post-secondary training. The options open to the student are: graduate from high school and enter the labor force, or continue further education, or both. Entering the military service in one of the many transportation occupations is considered under the continuing further education option. Other alternatives should be discouraged. For those who likely must work after graduation, but who have not yet received formal training, it is suggested that the student be enrolled in the cooperative education program working half days at suitable employment to assure the acquisition of skills to facilitate employment upon graduation.

Upon graduation, the school has the obligation to find suitable employment for the student, assist him in entering a post-secondary school, or assist in securing appropriate training when entering the military or civil service. Detailed placement and follow-up records should be kept on file for several years.

Graduation from high school with employable skills should not be construed as an indication of lesser ability or terminal education for the student. Most craftsmen and technicians will, and should, continue to seek post-secondary training through a variety of means leading to the associate, baccalaureate and graduate degree levels. Formal apprenticeships are also another desirable avenue to continued training and advancement in the transportation occupations. Work, in any combination with study, is the American way to advancement in many careers.

PROGRAM IMPLEMENTATION

The preparation phase of the Intermodal Transportation Career Education Program is intended to cause the student to attend the major developmental task:

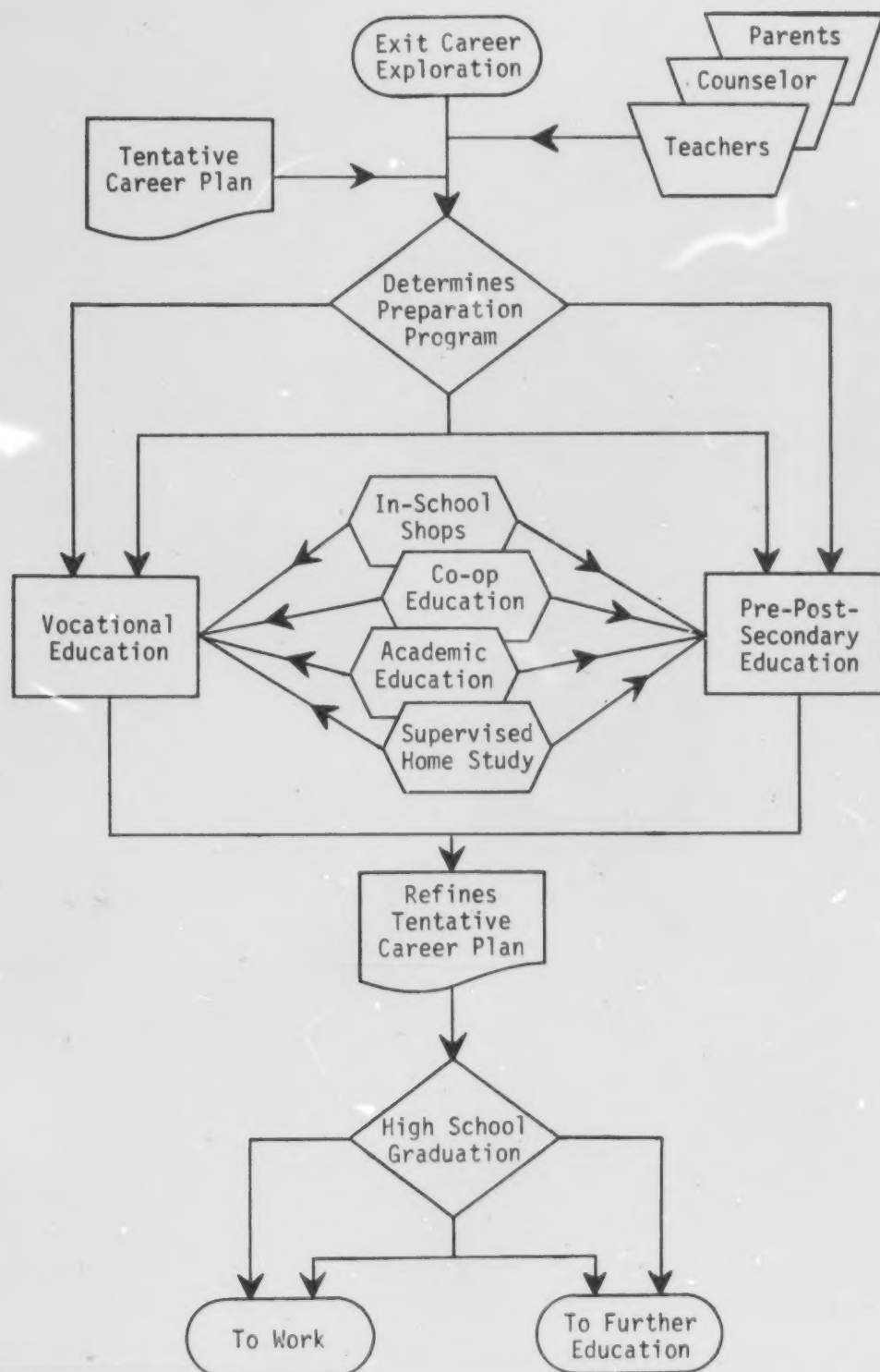
Implement enroute or immediate career plans through appropriate vocational education or pre-post secondary education, or both, using school shops, on-the-job training, appropriate academic course work, and/or supervised home study programs.

The following general objectives to accomplish this major developmental task are specified to be in agreement with the Transportation Career Preparation Flow Chart which illustrates the developmental process and the three options or routes available to the student (see the following page). General objectives may be thought of as major steps used to accomplish the major developmental task and lay the foundation for specific objectives around which day-lessons and activities for the student are generated.

The general objectives are stated as follows. The student:

1. Affirms tentative career plans developed as a result of the exploration phase of the Intermodal Transportation Career Education Program...
2. Specifies immediate career preparation via vocational education option or enroute career preparation via pre-postsecondary education option, or both...
3. Selects one or a combination of programs for immediate or enroute preparation options, including: in-school shops, co-op education, academic education or supervised home study...
4. Engages appropriate learning experiences specified in the learning prescription which are in agreement with the tentative career plan, vocational or pre-postsecondary education or combined option, and program of learning selected...
5. Refines tentative career plan in light of learning experiences...and
6. Upon graduation from high school, exits to work or to continue further education in a post high school program, or both.

The generalized model shown by the career preparation flow chart, and the six general objectives which elaborate the sequence, are intended to identify the route that the student takes through high school, his available options at specific times, and the programs which may be used to accomplish specific objectives



Transportation Career Preparation Flow Chart

from his learning prescription. The purpose of the model is to make intelligible what the student is doing at each step in the process, show how developmental activity is sequenced, and to indicate where content and skill activity are engaged to learn prescribed behaviors. The actual contact between the student and a learning environment where information about the intermodal transportation cluster is retrieved and processed occurs in the process blocks labeled *Vocational Education, and Pre-Post-Secondary Education*. The same is true of psychomotor skills such as operating or repairing a representative vehicle in a related laboratory class.

Of critical importance to the teacher implementing the model, and using learning materials and activities which relate to the transportation cluster, is knowing exactly how the program and content relate to existing programs. Because the transportation cluster is broad, and because it reaches across other content areas and programs in the school, it usually must be infused, rather than transplanted as an entity by itself. At least this is presently true because of the static inertia of existing programs, and the reluctance by school systems to change without first seeing positive results in a pilot test basis. For this reason, content and activities are to be used both in separate transportation courses labeled and taught within the broad based transportation career cluster program recently implemented in the school, as well as engineered to be infused in other existing courses which deal with one aspect of the transportation cluster or another. It is also important to avoid frustration, to remain infinitely flexible as both a program manager working with school staff and as a teacher working with students in the classroom, if implementation of the program is to be effective.

Teachers of transportation related programs present very little problem in accommodating the model program. Teachers in related programs and in other academic programs offer somewhat more of a challenge. They both should be solicited to use content and activities on a learning module basis to fit prescribed objectives for specific students. For example, the teacher in the Driver Education Program should be approached to assist in teaching certain learning modules related to highway land transportation to students in his classes who are preparing for transportation occupations. As another example, the teacher-coordinator managing the cooperative education program option should teach transportation learning modules to students who are in training at service stations, trucking firms, airports and other establishments where transportation systems are significant to the operation of the business.

Teachers of academic subjects should be similarly involved to assist with developing and implementing the transportation cluster program. While vocational education monies have supported the major

expense for the development of career education programs to date under state and federal funding, it is becoming increasingly apparent that all teachers have an active role to play in the career education program.

THE PLACE OF ACADEMIC COURSES IN CAREER EDUCATION

The position and function which academic courses occupy in the development of transportation cluster objectives and related activities may be summarized from the following three statements excerpted from a position paper adopted sometime ago by the National Association of State Directors of Vocational Education:

1. Career education is not synonymous with vocational education, but vocational education is a major component of career education.
2. Career education is an integral part of the total educational enterprise.
3. Career education involves all students — and all educators.

Academic teachers can contribute significantly by identifying occupations which have short and long range career objectives in available occupations that relate directly to the academic subject matter. For example, the subject matter in mathematics should be related to data management services occupations, the first of the twelve transportation occupational groups. Biology can easily be related to environmental services, another of the occupational groups. Other subjects should relate similarly to occupations which hold promise of fulfillment for all or several students in each class. Identifying related occupations and then assigning learning modules on an individual basis for extra credit might be one method used initially to infuse content and activities from the transportation cluster into each of the academic subjects. Of specific importance are the occupations by name, number category, opportunity outlook for work and advancement, pay scale and availability of local and regional employment. Specific content and skills from the occupation then should be used to develop selected occupational competencies via vocational shops and other specific programs.

PREScribed LEARNING

Specific objectives are used to give direction in planning individual day-lessons delivered in the classroom, laboratory activities in the laboratory, and packaged individualized learning modules for use by students and the transportation teacher or others who are involved in the program serving students in one of the five programs.

Day-lessons may be used for a variety of purposes, but typically convey information to the student, direct a discussion, or guide a demonstration. They are generated from a specific objective (student performance) and developed using a standard format. A variety of media including sound films are used to make the learning environment stimulating and interesting to the student. The lecture method is used sparingly as the delivery technique. A typical example of a title and specific objective for a day-lesson might be:

TITLE: The History of Transportation

OBJECTIVE: The student will list and then describe early development of the four modes of transportation.

It is noticed that the objective above states only who is performing and the task that is to be performed. Other components of the objective, i.e., the conditions under which the student is to perform (also given is delivery of the lesson by the teacher), the appropriate response and the evaluation criteria are developed during actual construction of the lesson. They are important, but mask the larger and more important initial assignment of the teacher to organize brief statements of performance to allocate available time in delivering material of the highest importance. A formal lesson plan is shown as an example at the end of this chapter and may be used in organizing selected day-lessons.

Laboratory activities which are supervised by the transportation teacher can be organized using the project plan job sheet or technical laboratory report. These organization methods state the title of the project, specific objectives to be accomplished by the student, procedures which are appropriate to guide the learning encounter and other components which set the conditions of learning, make the learning environment safe for the student and allow for the greatest number of alternatives for the student to accomplish the stated objectives.

Several methods are used to organize the individualized learning module, depending upon the teacher involved, the subject matter area, and the purposes for which the learning encounter is designed. The reader is referred to the September, 1971 issue of Educational Technology magazine for a variety of approaches to packaged individualized learning module formats. The individualized learning module should be flexible, give the student several alternatives to accomplish stated objectives and be short enough to be accomplished in less than five class periods. Time is kept short purposely to allow the student to respond to more and varied experiences and reduce the possibility of boredom sometimes associated with exercises of substantial length. In constructing the individualized learning module, the following components should be given careful consideration to assure the integrity of the learning process.

1. Title
2. Objectives
3. Listing of related occupations
4. Related information needed to complete the module delivered using a variety of media
5. Equipment, supplies and safety precautions
6. The procedure which includes a variety of appropriate activities
7. Summary questions if applicable
8. Other related activities
9. Student evaluation
10. Related sources of information

A typical individualized learning module of simple design is shown at the end of this chapter. The module is developed for use by students learning small engine repair. Notice that the related occupations are given by performance level, i.e., as trade and industrial, technical and professional. This is particularly useful to the teacher in helping the student assess potential by performance level. It also assures the integrity of the activity by causing the student to relate specific tasks performed in school to job descriptions and the other information about an occupation

at work, including employment opportunities, rate of pay, outlook etc. A substantial amount of information, media and related materials are available commercially to supplement teacher-made individualized learning modules.

DETAILED DEVELOPMENT OF THE PROGRAM

This section develops representative specific objectives for each of the six general objectives and suggests activities for meeting them. They are to be used as a *guide* in constructing day-lessons, organizing related student activities and developing individualized learning modules.

A point to remember is that this is a *guide* and intended as such. You, the teacher using this *guide*, should select those specific objectives and suggested activities that best meet the needs of your students; or modify them to meet those needs; or develop new ones as required to meet those needs. (In addition to the suggested activities that follow each objective, you may find others of value in the accompanying *Suggested Activities Guide for Intermodal Transportation Career Education*.)

General Objective 1.0

The student affirms tentative career plans developed as a result of the exploration phase of the Intermodal Transportation Career Education Program.

Specific Objectives

To meet general objective 1.0 the student:

- 1.1. Specifies realistic career choices...
- 1.2. Formalizes tentative career plan using a standard format...
- 1.3. Interacts with counselors and teachers testing the reality of tentative career plans...
- 1.4. Discusses tentative career plans in small group counseling sessions led by counselors and teachers...
- 1.5. Formulates available alternatives during high school in agreement with tentative career plan...and

- 1.6. Prepares a schedule of courses through high school and beyond which are requisite in implementing the tentative career plan.

Suggested Learning Activities

The purpose of this first general objective and each of the specific objectives is to assure that the student has been exposed to the exploration process in a meaningful way, and then to recrystallize his thinking before making decisions in the preparation phase of the program. It is likely that there has been a gap of at least three months (the summer break) since the last exposure to the exploration process.

Several class periods will be necessary to affirm tentative career plans in the light of recent experience and growth during the summer. Of major concern to the teacher should be that tentative career choices and tentative career plans are reality tested in counseling sessions with a knowledgeable professional, and then in small group settings with peers. Substantial congruency between tentative plans and reality can be attained using this method. Group interaction and activity must be serious with particular attention given to assurances that no student will be ridiculed or chided for open and forthright declaration of his future intentions to engage work and requisite preparation. The exercise should be summarized after all tentative career plans have been subjected to group discussion, using the standard career plan format as a summary document, dated when it is completed and include any notes that the student feels are needed to add clarification. The teacher should retain a copy of the revised career plan for use later in working out a learning prescription with the student.

General Objective 2.0

The student specifies immediate career preparation via vocational education option or enroute career preparation via pre-postsecondary education option, or both.

Specific Objectives

To meet general objective 2.0 the student:

- 2.1. Assesses the immediacy of imminent decisions (for example, the need to work immediately after graduation from high school)...

- 2.2. Assesses financial capabilities to attend post-high school training after graduation...
- 2.3. Assesses aptitudes, abilities, interests and tolerance for continued uninterrupted study after high school...
- 2.4. Assesses expectations of parents, relatives, teachers and peer group to pursue post-high school training...
- 2.5. Evaluates the probability of attaining short and long range goals using one of the three options available...and
- 2.6. Makes informed choice of option by completing the remainder of high school program schedule and having parents corroborate decision by signing validation card.

Suggested Learning Activities

In the process of meeting this second objective the student is attempting to make an informed choice between three options available through high school. While the decision is not irrevocable, it must be made before his program can be planned and the learning prescription made. The decision is made to pursue immediate career goals via the vocational education option if the student has limited desire to attend post-high school without an interruption, if financial capability is limited or he must work to support related obligations, and if natural inclination, ability, interest, grades and other indicators of success in college or specialized schools are lacking.

Again, it is likely that effective learning and information required to make an appropriate decision will require reality testing after recorded data from the guidance office and the tentative career plan are evaluated. The student should list responses to each of the specific objectives before entering into discussions in small group settings to validate and test the reality of both his impressions of his situation and the goodness of tentative decisions.

The final document for this general objective should be compiled from statements to each of the six (or more) specific objectives, including the course plan through high school, and validated by a signature from a responsible parent at home to corroborate the decision.

General Objective 3.0

The student selects one or a combination of programs for immediate or enroute preparation including: in-school shops, co-op education, academic education or supervised home study.

Specific Objectives

To meet general objective 3.0 the student:

- 3.1. Evaluates past success in school subjects by type of class and strategy used (for example, industrial arts class with informal instruction in the laboratory, or chemistry class with formal laboratory instruction)...
- 3.2. Evaluates past attendance records in school...
- 3.3. Evaluates tolerance for instruction in school facilities...
- 3.4. Compares type of training desired with commensurate educational opportunities at school and in other settings...and
- 3.5. Selects appropriate strategy which is compatible with the vocational or pre-post secondary program option, or both, and which will result in attainment of immediate or long range career objectives.

Suggested Learning Activities

Selection first of the option to pursue either the vocational or pre-post secondary education, or both, and then to engage learning experiences using one of the four available learning environments (see flow chart) is closely entwined with what and how the student learns. What the student learns should be determined by prescription, and detailed to the unit and task levels. How the student learns is variable, but the individualized learning model described previously seems to offer the best chance of success and implementation with existing school programs.

When the student selects one or a combination of the four learning environments, the teacher-counselor must consider several variables simultaneously when making the learning prescription. These include: the student's career goals, aptitude and inclination for the various modes of learning, how skills which the student

desires to learn relate to available learning environments (for example warehousing skills and the co-op program of learning are compatible, whereas academic and formal coursework are usually required to learn data management skills), and generally, how the total experience can be structured for the student and supervised by the school to assure the maximum probability that the student will succeed.

The output document specified for objective 3.0 is the learning prescription which identifies the option (vocational or pre-post secondary education, or both), the learning environment, or combination of them, that the student will use (in-school, co-op, academic or supervised home study) and the learning prescription. The learning prescription should list at least the competencies the student should possess prior to graduation from high school. Units of study for which learning modules can be developed are also required and should be generated from the career objective in much the same manner that training plans are presently developed for existing co-op education students. A sample training plan generated from a career objective and organized about general and specific related instruction is included at the end of this chapter.

The content for the learning prescription is drawn from two principal sources: The *Intermodal Transportation Career Education Occupational Cluster Paradigm* and any specific subject matter areas (for example auto mechanics) taken by the student to accomplish selected career objectives. A summary of the units which might be used in the development of individualized learning modules is included in general objective 4.0 and can be consulted as a preliminary reference prior to researching the resource document mentioned.

General Objective 4.0

The student engages appropriate experiences specified in the learning prescription which are in agreement with the tentative career plan, vocational or pre-postsecondary education or combined option, and program of learning selected.

Specific Objectives

To meet general objective 4.0 the student:

- 4.1. Acquires a definition of transportation, modes, and related business establishments...

- 4.2. Acquires and demonstrates a knowledge of transportation systems from a modal standpoint as well as the integration of the modes into an intermodal system...
- 4.3. Describes the national transportation policy as defined in the Interstate Commerce Act and the Transportation Act of 1970. (The importance of transportation to the economic well-being of the nation should be stressed)...
- 4.4. Acquires and demonstrates a knowledge of the historical development of transportation in the United States...
- 4.5. Describes the role of transportation in the economy...
- 4.6. Acquires a definition and understanding of the four transportation modes...
- 4.7. Observes, in person, four transportation modes at business establishments...
- 4.8. Traces the origin and development of the four modes of transportation...
- 4.9. Lists advantages and disadvantages of each type of transportation mode...
- 4.10. Compares each transportation mode with objective it accomplishes in moving persons and things from one location to another...
- 4.11. Describes several situations demonstrating interdependency between modes of transportation e.g., how one mode is combined with another...
- 4.12. Describes containerization and the advantages of its use in moving freight over more than one mode...
- 4.13. Lists and defines the 16 elements comprising the basic transportation core...
- 4.14. Categorizes transportation occupations using twelve occupational groups...
- 4.15. Lists several transportation occupations of interest, D O T Numbers, Office of Education Program numbers and describes each in writing...

- 4.16. Depicts preferred work and geographic location using scrapbook project technique (for example working on the Alaskan pipeline)...
- 4.17. Describes the role of the U.S. Department of Transportation as it influences transportation activities and administers the National Transportation Policy...
- 4.18. Describes the role of federal and state regulatory agencies in transportation activities, including highway planning, construction and maintenance...
- 4.19. Describes the role of regional planning commissions in transportation activities, including traffic, parking and conducting land use studies...
- 4.20. Describes the role of city government in transportation activities, including zoning, of transit system operation and coordination...
- 4.21. Describes the role of quasi-governmental agencies in transportation activities such as the New York (or a local) Port Authority and AMTRAK...
- 4.22. Observes and reports the significant aspects of one of the distribution functions (traffic management, freight forwarders, packaging or warehousing)...
- 4.23. Discusses selected problems and solutions which relate to urban transportation systems (subways, elevated rail, bus and streetcar), including the Mass Transportation Act of 1964...
- 4.24. Relates transportation systems to tourism (such as turnpikes and supporting restaurants)...
- 4.25. Describes recent examples of developments in transportation technology (air cushion vehicles, high speed trains etc.)...
- 4.26. Lists the names and functions of selected transportation associations (such as the American Trucking Association)...

Suggested Learning Activities

The purpose of objective 4.0 is to relate important and relevant information from the intermodal transportation cluster to

specific skill training the student is pursuing in one or a cluster of transportation occupations. That is, the specific objectives are used to develop individualized learning modules and these make up a portion of the learning prescription specified for each student. In the vocational education option which uses the in-school shop learning environment, for example, the learning modules would be infused with classroom instruction which relates to the particular specialty. As another example, if the student were entered in a co-op education program the learning modules would become part of general and/or specific related instruction that the student receives from the teacher coordinator in the classroom. While the information, discussion, field trips and other experiences are for preparation purposes, that is, the student relates selected activities to his learning prescription which prepares him for entry employment, activity does not enter the realm of how-to-do-it techniques. This is left to specific skill training where vocational teachers in specific areas, cooperating employers, academic teachers and others to manage their part of the learning prescription to help the student attain immediate or enroute career objectives.

If the transportation teacher is administering the program, his functions in sequence are to:

- a. counsel selected students from the school who are interested in transportation careers...
- b. write learning prescriptions using background information and other data, secured during the exploratory phase, which resulted in a tentative career plan...
- c. assist the student to schedule classes and activities which result in graduation from high school and attainment of immediate or enroute career plans in transportation occupations...
- d. teach one or more related classes to these students to insure that important concepts and information from the learning prescription are acquired and infused sequentially with other learning during high school...and
- e. collect follow-up information about graduates to assess the efficiency and effectiveness of the school sponsored program.

All manner of means to accomplish these functions should be considered. The teacher should think of himself as a manager. That is, he is coaching the student and setting the conditions of learning.

Sound films and other media are effective means to convey information. Individualized learning modules should allow for the student to retrieve selected information using this means in large group, small group single individualized learning and learning carrel settings.

Field trips, resource persons, personal interviews, group and individual projects, both in and out of school, student operated enterprises, public service projects and other means should also be considered. The rule to be observed, if there is one, is to stay as flexible as possible to accomplish the stated career objectives of the student as outlined in the learning prescription. The teacher's work and activity are generated from this source.

The following sections will suggest some activities to support some of the specific objectives under general objective 4.0.

Objectives 4.1 - 4.5. The work for these five specific objectives is based upon the Introduction to Transportation chapter in the Transportation Curriculum Project technical publication entitled *Intermodal Transportation Career Education: An Occupational Cluster Paradigm*. This chapter could be assigned for preliminary reading.

General Definition of Transportation. Discuss with the class the broad multidisciplinary scope of transportation; the movement of persons and things from one location to another. Students should be able to comment on all the various types of businesses that provide transportation services directly; such as airlines, railroads, bus companies, steamship companies, truck companies, taxicab operators, etc.. This discussion should be extended to cover supporting industries involved in serving transportation operations such as terminal operators, warehouse operators, airport activities, equipment manufacturers, etc.

Transportation Systems. It should be pointed out that the whole transportation system is designed to function as an integrated activity, each segment providing the service for which it has a particular advantage. The intermodal aspects of transportation should be introduced. Students may point out areas where modes combine to perform a service, e.g., local transit companies transport passengers to airports, trucks deliver freight shipments from railheads to customers who don't have their own rail sidings, commuters drive to fringe area parking lots where they board local transit systems for travel to the inner city, etc.

National Transportation Policy. A declaration of national transportation policy that lays down a general overall policy to be observed in the regulation of transportation was added to the Interstate Commerce Act by the Transportation Act of 1940. In the establishment of this act the Congress of the United States recognizes the importance of transportation to the economic well-being of the nation. Students should be made aware of the influence of the Federal Government on the transportation system and that it stems from the Congress of the United States.

History of the Development of Transportation. The four modes of transport have developed in the United States at different times. In 1780 only water and roadway transport were available and they were quite primitive in character. Steamboats made their appearance in 1807 and developed rapidly for use on western rivers, but declined in use rapidly after the Civil War. Modern barge transportation on inland waterways began in 1920 with the development of diesel engine tow boats. Intercity trucking developed rapidly after World War I. The Baltimore and Ohio was the first railroad in America constructed for general transportation purposes. As railroads developed, construction of canals was de-emphasized. The year 1830 marks the beginning of the Railroad Era in the United States. Pipeline transport was started in 1865 with commercial air transport coming along in 1926. As each mode of transportation was developed it had an adverse effect on the already operating modes. Students should be able to cite examples of the effects of competition between modes and relate the development of the transportation system with the westward movement.

The Role of Transportation in the Economy. Practically everything we, as individuals, use or consume has entered the transportation system at one time or another. Approximately twenty cents of every dollar spent for goods and services (GNP) in this country goes to purchase transportation. In 1967, almost 10 million persons were employed in transportation or transportation related industries. This means that about one person in every seven in the total work force is engaged in transportation related activity. About 25 percent of the transportation workers are involved with providing transportation service, 21 percent are employed in manufacturing transportation equipment, 8 percent are in government and 46 percent are in transportation related industries holding such jobs as gas station attendants, delivery men, automobile dealer employees, workers in the auto parts industries, etc. The Federal Department of Transportation employs almost 100,000 people. The American people drive more than a trillion miles and generate movement of about two trillion ton-miles (one ton moved one mile) of freight annually. This describes in general terms the all pervasive influence of the transportation system on our daily lives. The student should be able to identify how

transportation affects their individual daily lives and business activities in their local communities. Special effort should be made to point out the environmental effect of transportation in the community.

Objectives 4.6 - 4.10. Briefly discuss each of the four modes — land, water, aerospace and pipeline — with the students. They should have an understanding of the types of service, advantages and disadvantages of each of the modes. Discuss typical organizations, classifications of carriers and scope of operations to be found within each mode. Where possible, field trips to observe operations in each mode would be desirable in addition to arranging for representatives from each mode to talk to the students. In delving into the modes, students should be aware of the significance of the impact each mode has on the environment and give thought to actions being taken to reduce the adverse effects of transportation systems on the local environment, e.g., reduce pollution from auto engines and special planning to curtail noise and air pollution from airports. Normally private auto transportation is not considered one of the modes, however it should be pointed out that private autos constitute a significant segment of the transportation industry and are a source of job opportunities.

Objective 4.11 - 4.12. In order for transportation to optimize service to the public, it is essential that techniques be developed to facilitate movement of individual shipments of goods, and people as well, by more than one mode. This allows the various modes to operate as an integrated transportation system. Containerization is a concept that has advanced the state of the art significantly. The advantages are obvious; an inland shipper can load a container at his plant and it need not be opened until it arrives at its destination, even though it may travel by truck, rail, ship or aircraft. The importance of intermodal transportation should be discussed with the students. Some of the better known intermodal activities are:

1. Piggyback truck (trailer or container on flat car, barge, airplane, ship).
2. Roll-on roll-off ships.
3. Containerization (air-land-sea).
4. Barge carrying ships (Seabee - Lash).
5. Intermodal terminals.

Objectives 4.13 - 4.16. These objectives require reviewing the core of knowledge for the transportation cluster. Information to use as a basis for class discussion and review may be found in Chapter IV of *Intermodal Transportation Career Education, An Occupational Cluster Paradigm*. Discuss with the students these elements that are involved with all careers in transportation so that they may engage in self-assessment in these areas. The students should be introduced to the twelve transportation "Occupational Groups" which are covered in further detail in the same chapter. It should be pointed out to the students that skills needed for performance in each of these occupational groups apply to all modes of transportation. Such skills will strengthen their opportunities to work in more than one mode of transportation or perhaps make them better qualified for positions requiring coordination of more than one mode. Proper training in one or more of these areas will afford greater individual opportunities for job mobility both vertically and horizontally. With the assistance of the teacher, each student will be given the opportunity to examine, in depth, one or more occupational groups which he may be studying for a career. The student may communicate with individuals working in the selected occupational group or supervisors of personnel in the field. As a result of his analysis the student should be able to describe career patterns, salary levels, working conditions, required skills for entry level positions and subsequent promotion. In addition, he should be able to identify types of training needed to achieve his career goals and locate where the most promising job opportunities may be found.

Objectives 4.17 - 4.21. This group of objectives covers the study of government organization for transportation at all levels.

U. S. Department of Transportation. The organization and functions of the Department of Transportation should be presented to the students. The U. S. Department of Transportation (DOT) was established October 15, 1966 by act of Congress. A discussion of the functions of the office of the Secretary of Transportation and the operating administrations of the department should give the student an understanding of how the federal government influences transportation activities and carries out the National Transportation Policy.

Federal and State Regulatory Agencies. Discuss with the students the reasons for regulation of the industry. Regulatory activities in health and safety as well as economic regulation should be explained, pointing out that the prime objective of regulation is the development of a sound, efficient, safe transportation system fostered by the National Transportation Policy.

The history of regulation should be developed to include discussion of the non-regulated segments of the transportation system. Terms such as Certificate of Public Convenience and Necessity, grandfather rights, discriminatory rates, etc. should be explained in detail. The scope of regulation of the Interstate Commerce Commission, the Federal Maritime Board, the Civil Aeronautics Board and State Regulatory Commissions should be discussed.

State Transportation Organizations. Discuss with the students various functions of the state relative to transportation. Organizations vary from state to state although many have established a Department of Transportation in an effort to centralize transportation activities within the state and also to relate to the federal Department of Transportation. Specific functions may be allocated differently from state to state. One of the major functions of all states is highway planning, construction and maintenance. All states perform some regulatory controls over transportation. Highway safety programs is another transportation related function that is found in all states. The student should gain an understanding of how his state is organized to carry out its transportation responsibilities.

Regional Planning Commissions. Regional planning commissions are partially funded by the federal government and partially by local governments. They perform transportation planning activities within the designated area. Economic development or feasibility studies as well as traffic studies, parking or land use studies are conducted either internally or by contract with consulting firms. Discuss with the students the primary functions of the planning commissions and their activities in transportation.

City Transportation Functions. Discuss transportation functions within your city. Some of these are rather obvious; things such as traffic control, parking ordinances, etc. Others may not be so apparent; such as zoning as it affects location of terminals, airports, etc. Some cities may operate their own transit systems. In the event the city has a water port, a field trip to observe operations may be arranged.

Quasi-Governmental Transportation Organizations. These are non-political agencies of the government, created as a means of operating transportation activities. The most widely known of such agencies is the New York Port Authority. It is non-political, self-supporting and an agency of the states of New York and New Jersey established as a means of resolving the transportation difficulties within the New York City Metropolitan area; which includes a 25 mile radius from the southern tip of Manhattan. It

operates marine, rail, truck and bus terminals, bridges, tunnels, airports and the world trade center. AMTRAK is an agency created by the federal government to operate rail passenger service. Other examples of quasi-governmental organizations are local transit authorities, turnpike commissions, airport authorities, etc. Each is created for a specific purpose. Students should understand the reasons for creating such organizations, benefits resulting from them and their relationships to other government agencies.

Objective 4.22. This objective covers the various distribution functions of transportation.

Traffic Management. The student should be acquainted with the functions of the distribution manager and the traffic manager (who may sometimes function as the distribution executive). Highlight the importance of engaging in the various distribution activities and how each contributes to increased profits. Review with the students the various skills required and job opportunities that exist within the distribution or traffic departments of a local firm.

Freight Forwarders. Discuss the position of the freight forwarder in the transportation distribution system and how he functions as an indirect common carrier. The services performed and methods of operation should be described to the class.

Packaging. The relationship of packaging to transportation should be explained; such as the fact that heavy, bulky packing could significantly increase transportation costs. On the other hand, packaging which does not adequately protect the contents could increase damage claims, slow down delivery and upset production schedules.

Warehousing. Discuss with the students the advantages and disadvantages of public and private warehousing, the types of service available and the importance of warehouse location to the distribution system in both made-bulk and break-bulk operations.

Objective 4.23. Discuss with the students the functions of the various types of mass transit or urban transportation; such as subways, elevated rail, bus and streetcar. Congestion in urban areas precipitated by the automobile has created problems for growing metropolitan areas. This has been recognized by the federal government, resulting in the Mass Transportation Act of 1964 which provides for the development of new or improved technology, assistance to local governments in the planning effort and financial assistance to state and local governments to improve service. Subsequently, the Urban Mass Transit Administration was created

within the Department of Transportation to concentrate on these problems. Students might comment on mass transit service available to them, how they feel about the service, what improvements should be made. They may research the impact of an efficient system on the quality of life in terms of noise and air pollution, congestion, etc.

Objective 4.24. Discuss with the students the functions of a travel agency and how it operates, functions of the so-called tour wholesaler and how groups are put together to make up full unit loads. Other items for discussion are tourism supporting activities; such as hotels, restaurants, entertainment, etc. The student should understand the relationship between travel needs and the reasons people travel as tourists; such as conventions, sporting events, visits to historic or scenic locations.

Objective 4.25. As in the Volkswagon, many of the technological innovations in transportation are hidden and are not very obvious to the uninitiated. Things like high speed and communications, roller bearings in rail cars, the Shell Pancake and sophisticated traffic control systems all contribute to an improved transportation system. Transportation is in a continuous state of new development which should be exciting to a student preparing for a transportation career. Some of the new concepts being discussed are:

- Air cushioned vehicles
- New propulsion systems
- People moving systems
- Advanced aircraft (SST - STOL - VTOL)
- Dual Mode (automated guideways for vehicles)
- Pipeline travel for passengers
- High speed trains

Discuss with the students potential developments and possible impact on the quality of life.

Objective 4.26. Students should be informed about the important role transportation associations play in shaping transportation policy and coordinating the activities of their members. Normally, these associations are partisan in nature following a course of action that coincides with the best interests of their members. Associations of multi-mode organizations such as the Transportation Association of America are more detached from partisan issues. These trade associations expend a significant amount of time and money lobbying both at state and federal levels and carry out rather extensive public relations programs directed at improving the public image of their members. They can be good sources of information material on the particular segment of transportation

they represent. The following is a partial list of the larger organizations; it should be noted that most are headquartered in Washington, D. C. and most have state organizations as well.

Air Transport Association
International Air Transport Association
Association of American Railroads
American Trucking Association
American Merchant Marine Institute
American Maritime Association
Inland Waterways Common Carrier Association
American Waterways Operators
United Transportation Union
Transportation Association of America
American Society of Transportation and Traffic
National Highway Users Conference
National Association of Motor Bus Operators

Students should be encouraged to correspond with these organizations for information and guidance on issues of specific interest.

General Objective 5.0

The student refines tentative career plan in light of learning experiences.

Specific Objectives

To meet general objective 5.0 the student:

- 5.1. Reviews tentative career plan and the learning prescription in light of recent learning experiences...
- 5.2. Considers alternate routes to attain immediate or enroute career objectives...
- 5.3. Assesses degree of success, both in and out of school, using present learning prescription...and
- 5.4. Affirms present course of action or rewrites selected parts of learning prescription.

Suggested Learning Activities

The transportation teacher's function here is to assist the student to accept or reject his present course of action in light of experiences engaged to date by direction of the learning

prescription. This might be done at several intervals during high school. Ideally, the learning prescription should be reviewed at the end of each marking period or semester. While the student should have the opportunity to change the learning prescription at any point in time, requests for frequent changes should be viewed as a sign that problems are being encountered by the student without success, the vocational maturity of the student may be in question, and intensive diagnostic and counseling services should be sought from professional sources.

Typically, the transportation cluster teacher should engage students in small groups and individually using specific objectives as a guide to the encounter. Reviewing tentative career plans, for example, could be accomplished by having students explain to the peer group exactly what they are doing with the learning prescription, and how specific career objectives are being attained. Similarly, other specific objectives can be used to arrive at stated outcomes. The outcome of the experience should be corroboration of the learning prescription in its present or revised form by the teacher, student, parent, other cooperating teachers and employers by sign ture. Involved parties should indicate that the student is receiving the attention necessary to feel confident with his present or newly derived course of action.

General Objective 6.0

The student, upon graduation from high school, exits to work or to continue further education in a post-high school program, or both.

Specific Objectives

To meet general objective 6.0 the student:

- 6.1. Prepares post-high school plan of action...
- 6.2. Applies for post-high school education or work, or both...
- 6.3. Describes near-future life style...
- 6.4. Prepares monthly budget, based upon expected life style and salary, for immediate implementation...
- 6.5. Plans personal transportation to work or school, or both...

- 6.6. Assumes new duties as worker or post-high school student, or both...and
- 6.7. Responds to follow-up surveys and interviews to assess efficiency and effectiveness of program.

Suggested Learning Activities

This is the final step in establishing the student in meaningful employment or education or both. The transition should be started at least thirty days prior to graduation and counseling services and follow-up should be made available to the student through age twenty-one. Inherent in the objective is the obligation of the school to place the student. This includes setting up job and school interviews, processing applications, transferring credentials, writing recommendations, developing jobs in the community, following up graduates, collecting and interpreting statistical data, and changing the program in light of the evidence from graduates and advisory committee members.

Total Time _____

LESSON PLAN GUIDE

Title _____ Type _____

INTRODUCTION: Time _____

OBJECTIVES: Time _____

PRESENTATION: Time _____

DISCUSSION: Time _____

APPLICATION: Time _____

EVALUATION: Time _____

ASSIGNMENT: Time _____

FACILITIES AND TEACHING AIDS: _____

REFERENCES: _____

TRAINING MEMORANDUM

1. Student's Name _____ 2. Date _____
2. Career Objective _____ 4. Training Station _____
5. Paid Work Assignments _____

6. The student-learner is enrolled in the industrial cooperative training program beginning _____ ending _____.
7. The school agrees to provide the student-learner with _____ hours of supplemental technical and related instruction each week in a related study class restricted to student-learners. This instruction will be correlated with the job experience of the learner, in so far as possible.
8. The employer agrees to provide on-the-job instruction and supervision of the student-learner. The student-learner is assigned to _____, a competent adult. In-school related instruction will be organized and supervised by _____, the teacher-coordinator.
9. The student-learner will be paid a beginning wage of _____ per hour during a probationary period of _____ days. Thereafter, wages will be subject to periodic review, and raises will be earned in keeping with employer policy and personal merit.
10. The student-learner will gain job experience from _____ to _____ on each school day, from _____ to _____ on Saturdays and from _____ to _____ on Sundays.
11. For one year of successful participation in the cooperative program, the student-learner will earn _____ units of high school credit.
12. The teacher-coordinator agrees to visit the training station at regular intervals to observe the student-learner on the job, to discuss and evaluate his job progress with his employer and job trainer, and to find out what related instruction is needed at a particular time.

13. The student agrees to perform all his training stations and classroom responsibilities thoroughly.
14. The parent or guardian agrees to be responsible for the personal conduct of the student-learner while in training.
15. All complaints from parents, learner, or employing agency should be made to the teacher-coordinator who will take steps to remedy difficulties.
16. The training relationship may be dissolved by any of the parties directly involved, but should be preceded by consultation with the teacher-coordinator.
17. No full-time or regular employee will be displaced by the employment of a student-learner.
18. Student employment will be within the provisions of all state and federal child labor laws, and existing labor-management agreements.
19. Signatures:

Student-Learner

Teacher-Coordinator

Parent or Guardian

Employing Agency

Name _____

TRAINING PLAN

I. Career Objective: Automotive Line Mechanic

II. Training Station: Terre Haute Chrysler-Plymouth

III. General Related Instruction

1. Trainee will:	In Class	On Job	Rating				
			1	2	3	4	5
a. Fill out social security card application	x		1	2	3	4	5
b. Fill out work permit form	x		1	2	3	4	5
c. Fill out employment application	x		1	2	3	4	5
d. Write a resume	x		1	2	3	4	5
e. Fill out state tax forms	x		1	2	3	4	5
f. Fill out federal tax forms	x		1	2	3	4	5
g. Study provisions of workman's compensation laws	x		1	2	3	4	5
h. Study provisions for unemployment compensation	x		1	2	3	4	5
i. Study current provisions of social security	x		1	2	3	4	5
j. Write a paper and discuss proper job attitudes	x		1	2	3	4	5
k. Play the role of an employer in a job interview	x		1	2	3	4	5
l. Play the role of a prospective employee in a job interview	x		1	2	3	4	5
m. Discuss possible job fringe benefits.	x		1	2	3	4	5
n. Write paper and discuss the importance of getting along with others	x		1	2	3	4	5

- | | | |
|---|---|-----------|
| o. Write paper and discuss the advantages and disadvantages of labor unions | x | 1 2 3 4 5 |
|---|---|-----------|

IV. Specific Related Instruction

1. Lubrication Service trainee will:

- | | | |
|---|---|-----------|
| a. List the safety precautions to observe when performing lubrication service | x | 1 2 3 4 5 |
| b. List the correct and safe procedures to follow when using hydraulic lifts . . . | x | 1 2 3 4 5 |
| c. List the procedure to follow when performing lubrication service | x | 1 2 3 4 5 |
| d. Be able to determine lubrication service specifications for all late model automobiles by using lubrication service guides | x | 1 2 3 4 5 |
| e. Make a list of the visual inspections made when performing lubrication service | x | 1 2 3 4 5 |
| f. Be able to identify service requirements for different types of lubricants | x | 1 2 3 4 5 |
| g. Write a paper and discuss the function and purpose of each component making up the automotive lubrication system | x | 1 2 3 4 5 |
| h. Write a paper and discuss correct procedures for cleaning, inspecting and packing wheel bearings | x | 1 2 3 4 5 |
| i. List correct and safe procedures for battery testing and service . . . | x | 1 2 3 4 5 |
| j. List correct procedures for testing, cleaning and replacing induction system air filter | x | 1 2 3 4 5 |

- k. List correct and safe procedures
for testing and servicing cooling
system x 1 2 3 4 5

2. Brake System Service

Trainee will:

- a. List the correct and safe procedures
to observe when using lifting devices
on an automobile x 1 2 3 4 5
- b. List the correct and safe procedures
for using safety stands x 1 2 3 4 5
- c. Develop a logical and systematic
procedure for brake system
trouble shooting x 1 2 3 4 5
- d. List correct and safe procedure for
brake teardown, cleaning and
inspection x 1 2 3 4 5
- e. Be able to identify and explain the
function of each component making
up dual servo, balanced disc brake
mechanisms x 1 2 3 4 5
- f. List the procedures for correct
and safe wheel cylinder service . . . x 1 2 3 4 5
- g. List correct procedure for
determining brake drum and disc
wear x 1 2 3 4 5
- h. List the correct and safe procedure
for brake drum and disc recon-
ditioning x 1 2 3 4 5
- i. List the correct and safe procedure
brake shoe arcing x 1 2 3 4 5
- j. List the correct and safe procedure
for brake shoe and pad installation . x 1 2 3 4 5
- k. List the correct procedure for
initial brake shoe adjustment x 1 2 3 4 5

- l. List correct and safe procedures for master brake cylinder reconditioning and replacement x 1 2 3 4 5
 - m. List correct and safe procedures for brake system bleeding x 1 2 3 4 5
 - n. Name and explain operation of the different types of power brakes vacuum assists x 1 2 3 4 5
 - o. List and explain correct and safe procedures for power brakes trouble shooting x 1 2 3 4 5
3. Exhaust System Service
- Trainee will:
- a. List the symptoms and effects of carbon monoxide on the human body x 1 2 3 4 5
 - b. List the correct and safe procedures for exhaust system service x 1 2 3 4 5
 - c. List the correct and safe procedure for using pipe cut off tool and pipe expander x 1 2 3 4 5
 - d. List correct and safe procedure for using pneumatic cutting tools . . x 1 2 3 4 5
 - e. List correct and safe procedure for operating the acetyline cutting and welding torch x 1 2 3 4 5
4. Shock Absorber Service
- Trainee will:
- a. Explain the purpose of shock absorbers on the automobile x 1 2 3 4 5
 - b. Discuss the design and operation of current production shock absorbers x 1 2 3 4 5

- c. List the correct and safe procedures for shock absorber service x 1 2 3 4 5
- d. Explain the basic test for proper shock absorber operation x 1 2 3 4 5

5. Tire Service

Trainee will:

- a. Write a paper listing function and construction of pneumatic tires x 1 2 3 4 5
- b. List the correct procedure for tire inspection x 1 2 3 4 5
- c. List the correct procedure for tire inflation x 1 2 3 4 5
- d. List correct and safe procedure for using the tire changer x 1 2 3 4 5
- e. Draw a diagram and explain correct tire rotating procedures x 1 2 3 4 5
- f. List correct and safe procedure for tire service x 1 2 3 4 5
- g. List the correct and safe procedure for tire balancing x 1 2 3 4 5
- h. List the correct and safe procedure for using pneumatic impact wrench . . x 1 2 3 4 5

V. Paid Work Assignments

Trainee will employ correct and safe procedure for:

Assignment: Perform lubrication service, operations included:

- a. Lifting auto x 1 2 3 4 5
- b. Chasis lubrication x 1 2 3 4 5
- c. Changing oil and filter x

- d. Checking all fluid levels -
if necessary adjust x 1 2 3 4 5
- e. Visual inspection x 1 2 3 4 5
- f. Air Cleaner service x 1 2 3 4 5
- g. Battery service x 1 2 3 4 5
- h. Checking belts x 1 2 3 4 5
- i. PCV inspection x 1 2 3 4 5

Assignment: Repack wheel bearing, operations included:

- a. Removing wheel x 1 2 3 4 5
- b. Removing x 1 2 3 4 5
- c. Cleaning bearing and case x 1 2 3 4 5
- d. Inspecting bearings and case x 1 2 3 4 5
- e. Packing wheel bearings x 1 2 3 4 5
- f. Replacing wheel bearings x 1 2 3 4 5
- g. Replacing seal x 1 2 3 4 5
- h. Replacing lub x 1 2 3 4 5
- i. Adjusting proper preload on bearings. x 1 2 3 4 5
- j. Replacing dust cover x 1 2 3 4 5

Assignment: Perform complete brake service:

- a. Lifting and securing auto using
safety stands x 1 2 3 4 5
- b. Removing wheels and drums x 1 2 3 4 5
- c. Removing brake shoes x 1 2 3 4 5
- d. Disassembling wheel cylinder x 1 2 3 4 5
- e. Cleaning brake backing plates x 1 2 3 4 5

f. Honing wheel cylinders	x 1 2 3 4 5
g. Rebuilding wheel cylinder	x 1 2 3 4 5
h. Tuning brake drums	x 1 2 3 4 5
i. Arcing brake shoes	x 1 2 3 4 5
j. Checking brake lines	x 1 2 3 4 5
k. Cleaning and lubricating adjusters . .	x 1 2 3 4 5
l. Reassembling brake for each wheel . .	x 1 2 3 4 5
m. Initial adjusting of brake shoes . . .	x 1 2 3 4 5
n. Repeat operations listed for front wheel bearing packing	x 1 2 3 4 5
o. Removing and disassembling master cylinder	x 1 2 3 4 5 ;
p. Honing master cylinder	x 1 2 3 4 5
q. Rebuilding master cylinder	x 1 2 3 4 5
r. Filling and bleeding of master and wheel cylinders	x 1 2 3 4 5
s. Test driving automobile	x 1 2 3 4 5

Assignment: Perform complete disc brake service:

a. Lifting and securing auto by using safety stands	x 1 2 3 4 5
b. Removing wheels	x 1 2 3 4 5
c. Removing calipers	x 1 2 3 4 5
d. Removing pads	x 1 2 3 4 5
e. Removing disc	x 1 2 3 4 5
f. Cleaning calipers and disc	x 1 2 3 4 5
g. Rebuilding wheel cylinders	x 1 2 3 4 5

h. Reassembling caliper	x	1	2	3	4	5
i. Reinstalling pads	x	1	2	3	4	5
j. Reinstating disc	x	1	2	3	4	5
k. Reinstalling caliper	x	1	2	3	4	5
l. Removing and disassembling tandem master cylinder	x	1	2	3	4	5
m. Reconditioning master cylinder	x	1	2	3	4	5
n. Reinstall master cylinder	x	1	2	3	4	5
o. Bleeding hydraulic system	x	1	2	3	4	5

Assignment: Perform complete exhaust system service:

a. Removing complete exhaust system . . .	x	1	2	3	4	5
b. Inspecting or installing new clamps or hangers	x	1	2	3	4	5
c. Freeing heat riser valve	x	1	2	3	4	5
d. Installing and positioning exhaust system components	x	1	2	3	4	5
e. Checking exhaust system for exhaust leaks	x	1	2	3	4	5

Assignment: Perform tire service:

a. Inspecting and inflating tire to correct pressure	x	1	2	3	4	5
b. Mounting a set of tubeless tires . . .	x	1	2	3	4	5
c. Repair tubeless tires	x	1	2	3	4	5
d. Repair tube from tire	x	1	2	3	4	5
e. Rotating a set of tires including spare	x	1	2	3	4	5
f. Balance a set of tires with an on the care balancer	x	1	2	3	4	5

Name _____

DETERMINING THE TORQUE, SPEED AND BRAKE
HORSEPOWER FOR A SINGLE CYLINDER 4-STROKE
CYCLE ENGINE

Summary

The purpose of this procedure is to determine the torque, speed and brake horsepower output of a single cylinder, 4-stroke cycle engine. Graphs of torque and brake horsepower vs. speed are drawn, and related questions follow.

Related Occupations

Engineering: Mechanical Engineer DOT 007.181
Automotive Engineer DOT 007.081

Technical: Automotive Test Shop Supervisor DOT 620.138
Automobile Tester DOT 620.281

Trade: Automotive Service Specialist DOT 620.381
Automobile Racer DOT 153.248
Automobile Mechanic Chief DOT 620.131

(photo of the test apparatus)

Definitions

Torque - a twisting or turning effort and is measured in terms of force through distance.

Speed - the rate at which the output shaft is turning, in rpm's, revolutions per minute.

Power - the rate at which work is done or is produced.

Absorbing Dynamometer - a device for measuring power output of an engine.

Brake Horsepower - the power delivered by the engine which is available for driving the vehicle.

Information

Torque and speed are the terms that describe the power that is measurable at the output shaft. Both are measurable directly from a running engine and both will yield additional data and calculations. See formulas for additional data.

Equipment and Supplies

1. Scott Model 9057 Engine measurement system with 4-stroke cycle engine.
2. Portable absorption dynamometer and engine tachometer.
3. Safety equipment, goggles and CO₂ bottle.

Performance Procedure

1. Install safety equipment, locate a CO₂ bottle, goggles and circulating fan if one is necessary. ok__
2. Check fuel level of the engine ok__
3. Check oil level of the engine. ok__
4. Start and let engine warm up for at least five minutes before starting the torque, speed and power test ok__
5. The engine should be operated under no load conditions, but not to exceed 4500 rpm's ok__

6. To measure engine speed and torque, first read and check the following before doing said tests:
- a. Check to see if water is turned on, and rain is working correctly. ok__
 - b. Apply a slight load to the engine and open the throttle by applying more or less load; read the torque and place data on table 1 ok__
 - c. The engine should be allowed to stabilize for 10 seconds before taking a reading. ok__
 - d. The engine should not be allowed to exceed 4500 rpm. . ok__

Table 1

Engine Speed, Torque and Brake Horsepower

<u>rpm</u>	<u>4500</u>	<u>4000</u>	<u>3500</u>	<u>3000</u>	<u>2500</u>	<u>2000</u>
<u>Torque</u>	_____	_____	_____	_____	_____	_____
<u>bhp</u>	_____	_____	_____	_____	_____	_____

7. Complete graph 1 from data collected, and draw and label the points on the curve. ok__

Graph 1

Engine Torque and Brake Horsepower Vs. Speed

Calculations

Calculate the gross brake horsepower for each 500 rpm interval and insert in the blanks.

Formulas

$$1. Q = L \times R$$

Where Q = Torque (in foot pounds),

L = Force (in pounds), and

R = Length of the arm (in feet).

$$2. \text{ bhp} = \frac{QN}{5252}$$

Where N = rpm and

5252 = Constant

NOTE: Power divided by 33,000 (the number of foot pounds per minute in each horsepower) equals brake horsepower output.

Questions

1. Given just the torque and power curves for this engine, what facts could be said for or against it?
2. What is the advantage of having a tachometer on an engine?
3. Name different engine types which might be tested using torque and power curves and applications which use these powerplants?
4. Assuming torque doesn't peak, list what might limit brake horsepower output.
5. As engine speed increases, torque increases and then decreases. What factors might cause this to happen?
6. Why are the different features important in the design and production of dynamometers?
7. Did you learn anything about Torque, Speed and Power in doing this experiment, and how can you relate it to other things?

References

Freeman, Ira M. *Physics Made Simple* (Garden City, New York: Doubleday and Company, 1965)

Crouse, William H. *Automotive Engines* (New York, New York: McGraw-Hill Book Co.)

VI

GENERAL RESOURCES

BOOKS, BOOK LISTS AND PAMPHLETS

This chapter includes an exhaustive listing of resource materials available on transportation. It includes books, articles, films and filmstrips and periodicals. Whenever possible, complete information is provided (including prices, addresses, descriptions of material, etc.). This list of resources will be continually updated by the Transportation Curriculum Project staff. Any errors in information or additional resources discovered by you in your management of this career education program should be noted on the final pages of this chapter and subsequently reported to the project staff. This will facilitate staff work toward making this resource listing as accurate and comprehensive as possible. Your assistance in this task is critical to the effective compilation of concise information.

You will note that many of the resources suggested herein pertain to specific occupations or families of occupations. You should refer to these resources when covering appropriate sections in the document *Intermodal Transportation Career Education: An Occupational Cluster Paradigm*, the source book of occupational information developed by the Transportation Curriculum Project for use with this teachers guide.

Suggestions for this list were obtained from many different sources and resultingly, the amount of information provided about these items has also varied. If an item has seemed especially interesting — or relatively unduplicated by other items — it has been included here, even though information about it might be somewhat incomplete.

Most usually this has occurred with items that were published prior to 1970 or that are now out-of-print. Some of these have been included in this list if sources indicated that they still contain relevant information and are still available in many school and public libraries.

Whatever information might be lacking on certain items, the complete name and address of the publisher is included in each case. This will permit the teacher or student to contact the source of any item not available in local libraries.

In the publishing industry, prices have increased in recent years and, in addition, prices of educational books tend to fluctuate according to who orders them and from what source they are obtained. Unless items are free or unusually expensive, prices are omitted in the following lists due to the great difficulty involved in remaining current as new editions of these works appear. However, this should provide no difficulty in ordering these books, since all of these publishers will extend credit to schools and responsible persons connected with them. The sole exception to this is the U. S. Government Printing Office — but it provides very rapid response when current prices are requested.

1. *Aim for a Job in Automotive Service*. Authors: Dawson Taylor and James Bradley.
Aim for a Job in Trucking. Authors: John P. McGill and W. L. Robinson, Published by Richards Rosen Press, 29 E. 21st St., New York, N.Y. 10010.

Both books cover sales, marketing, operations, safety, maintenance, public relations, advertising, accounting and traffic as well as driving.

2. *A List of Books for Possible Use in Teaching or Studying Railroad Transportation in Colleges or Universities*. Prepared and published by: Association of American Railroads, Transportation Building, Washington, D. C. 20006; 1969; Free.

This pamphlet is intended as a guide to the instructor teaching transportation courses. It represents a compendium of texts and recommended readings for those interested in railroad transportation.

3. *American Association of Junior Colleges Aviation Guidelines*. Author: Harold L. Finch; Published by: American Association of Junior Colleges, One Dupont Circle, Northwest, Washington, D. C. 20036; 64 pages.

A booklet dealing with the establishment of an educational program in any one of the general areas of air transportation, including: Aviation Education — The Big Picture; Getting Started — General Guidelines; and Aviation Programs.

4. *American Trucking Trends*. Prepared and published by: American Trucking Association, Inc., 1616 P Street, N.W., Washington, D. C. 20036; 1971; 36 pages, Free.

Provides all-round coverage of the trucking industry. Teachers will find in it many facts and figures about trucking occupations, and students themselves will be able to use it as a resource.

5. *America On The Move*. Published by: U. S. Department of Transportation, Washington, D. C. 20590; 1972.

A collection of stories introducing transportation in America—past, present and future. Bibliography.

6. *Aviation and Transportation Majors and Curricula Offered by Colleges and Universities*. Prepared and published by: Office of General Aviation Affairs, Federal Aviation Agency, U. S. Department of Transportation, Washington, D. C. 20590; 1970.

This is a listing of colleges and universities, (classified by status) which offer majors and curricula in Aviation and Transportation.

7. *Aviation Education Bibliography*. Produced and published by: National Aerospace Education Council, 616 Shoreham Building, 806 15th Street, N.W., Washington, D. C. 20005; 1967.

This booklet consists of an annotated series of selected materials relating to education in the field of aviation.

8. *Aviation, Where Career Opportunities Are Bright*. Available from: National Aerospace Education Council, Room 616, Shoreham Building, 806 15th Street, N.W., Washington, D. C. 20005; 1968.

Available in three forms — as a student handbook, as a Counselor's guide, and as a film strip. For each of the following, the kinds of jobs, need for personnel, salaries and working conditions are outlined: Aircraft Manufacturing Occupations; Career Pilots and Flight Engineers; Aviation Mechanics; Airline Careers; Airline Stewardesses or Stewards; Aviation Careers in Government; Airport Careers; and Aviation Education and Other Aviation-Related Careers.

9. *Barge and Towing Industry Catalog of Publications, Films and Information Resources*. Prepared and published by: American Waterways Operations, Inc., Suite 502, 1250 Connecticut Avenue, Washington, D. C. 20036; 1967; Free.

This list is restricted to water carriers.

10. *Bibliography of Railroad Literature, 8th Edition*. Prepared and published by: Association of American Railroads, Transportation Building, Washington, D. C. 20006; Free.

This bibliography is intended to list the most outstanding books and stories about railroads. Books are grouped under these headings: Childrens Books; Juvenile Books; General Literature; Model Railroading. Also included are sections on Railroad Statistics and Railroad and Travel Periodicals.

11. *Career Opportunities in Aviation*. National Aerospace Education Council, Shoreham Building, 806 15th Street, N.W., Washington, D. C. 20005; 1967.

Presents a concise but detailed survey of aviation career opportunities. Particular attention is given to the aviation mechanics field. There is also a complete roster of F.A.A. certificated aviation mechanic schools.

12. *Careers in Aerospace*. Published by: American Institute of Aeronautics and Astronautics, 1290 Avenue of the Americas, New York, N.Y. 10019; 1972.

Booklet providing information on aerospace careers requiring college education. Lists schools and additional information sources. Bibliography.

13. *Careers in Aviation*. Reprinted from Flying Magazine, August, 1963. Distributed by: National Aerospace Education Council, 616 Shoreham Building, 806 15th Street, N.W., Washington, D. C. 20005.

This article presents a survey of careers in aviation which is still timely.

14. *Careers in the American Railroad Industry*. Author: Charles O. Margret; Published by: Bellman Publishing Company, P. O. Box 172, Cambridge, Massachusetts; 1960; 32 pages.

A fairly comprehensive outline of careers in the railroad field, although some of the material is not out-of-date.

15. *Containers: Land, Sea, Air.* Prepared and published by:
American Trucking Associations, Inc., 1616 P Street, N.W.,
Washington, D. C. 20036; Free.

This booklet outlines the implications of containers in cargo transportation.

16. *Dictionary of Occupational Titles, 3rd Edition.* Prepared by:
Bureau of Employment Security, U. S. Department of Labor.
Distributed by: Superintendent of Documents, U. S. Govern-
ment Printing Office, Washington, D. C. 20402; 1965.

A comprehensive guide to all occupations, including those in transportation. Most jobs are defined in broad terms. There is a certain amount of cross-referencing in these two volumes according to job characteristics and other elements.

17. *Directory of Transportation Education in U. S. Colleges and Universities.* Author: Jean M. Walker. Published by:
American Trucking Associations, Inc., 1616 P Street, N.W.,
Washington, D. C. 20036; 24 pages; Free.

This pamphlet is for students interested in careers in transportation requiring education beyond high school and for others interested in taking courses in this field.

18. *Domestic Transportation. Practice, Theory and Policy.*
Authors: Roy J. Simpson and Martin T. Farris; Published by:
Houghton Mifflin Company, 2 Park Street, Boston, Massachu-
setts 02107; 1971;

A college textbook which could prove a useful reference for the teacher concerned with this field. The contents cover the following areas: The Role of Domestic Transportation; Economic Characteristics and Performance of Domestic Transportation; Carrier Services in Domestic Transportation; Regulation of Domestic Transportation; Goals in Domestic Transportation Policy; Transportation Aspects of Physical Distribution Management.

19. *Facing Facts About Choosing Your Life's Work.* 1968.
Facing Facts About Preparing for Your Future. 1971.
Facing Facts About the Two-Year College. 1970.
Facing Facts About Your College Career. 1971.
Published by: The Prudential Insurance Company, Box #36,
Newark, N.J. 07101; Free.

Personal booklets with paper and pencil self-inventories.
Bibliography.

20. *General Motors Dealership Career Day Kit*. Prepared and published by: Career Program Service Section, General Motors Corporation, Room 8-151, General Motors Building, 3044 W. Grand Blvd., Detroit, Michigan 48202; Free.

This Career Kit is of varied contents, including a handbook, pamphlets, and a motion picture. Its purpose is to interest young people in the retail automotive business.

21. *Guidance Publications*. Published by: Guidance Center, University of Toronto, 371 Bloor Street, W., Toronto 5, Ontario, Canada.

These brief monographs deal with individual occupations. Some relate to transportation, (Example: Bus Driver). Each monograph describes the job involved, personal and educational requirements, entrance and advancement, earnings, working conditions, and advantages and disadvantages of the job. Most of the included information applies equally to the United States as to Canada.

22. *Handbook of Transportation in America*. Author: Charles Lunz; Published by: Popular Library, 355 Lexington Avenue, New York, N.Y. 10017; 1971.

Discusses rail, motor, air and water transportation. The emphasis is on their historical backgrounds and the Federal Government's regulation of each.

23. *Highway Safety Occupational Opportunities*. Highway Users Federation for Safety and Mobility, Washington, D. C. 20036; 1970; 372 pages.

Outlines what the field of highway safety offers in occupational opportunities. Covers occupations in driver and traffic safety education, emergency medical services, highway safety programs administration, police traffic services, traffic engineering, and traffic law and records.

24. *Highway Safety Occupational Program Development Guide*. Authors: Ronald Daugherty, W. Kent Brooks and Carroll R. Hyder. Published by: Center for Vocational & Technical Education, Ohio State University, 1900 Kenny Road, Columbus, Ohio 43210; 1971.

This book presents an overview of the field of highway safety, including eleven occupations in this area which appear to have the greatest potential. It also includes curriculum materials.

25. *An Introduction to Aerospace Education.* Editor: Mervin K. Strickler, Jr.; Published by: New Horizons Publishers, Inc., Chicago, Ill.; 1968.

Programs and activities for introductory aerospace education at all grade levels. Bibliography.

26. *Job Guide For Young Workers.* Prepared by: Manpower Administration, U. S. Training & Employment Service; Distributed by: Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.

Includes information on such matters as obtaining jobs, but the greater part of it is devoted to descriptions of 150 occupational groups frequently entered by youth after they graduate from high school. Jobs in the transportation field are included.

27. *Materials For Occupational Education: An Annotated Service Guide.* Author: Patricia Schuman, Published by: R. R. Bowker Company, Order Department, P.O. Box 1807, Ann Arbor, Michigan 48106; 250 pages.

This book lists 600 organizations, associations, government agencies and companies which publish instructional materials relating to occupational education. There is a section on Traffic and Transportation.

28. *Modern Transportation Economics.* Author: Hugh S. Norton, Published by: Charles E. Merrill Publishing Company, 1300 Alum Creek Drive, Columbus, Ohio 43216; 1971.

This book is divided into five sections. Part I presents an over-all view of the transportation industry. Part II discusses the production of (and demand for) transportation service. Parts III and IV discuss regulatory and policy issues. Part V considers certain broad aspects of current policy problems.

29. *Motor Carrier Safety Regulations.* Prepared by: U. S. Department of Transportation, Distributed by: Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402; 1971.

This booklet is the most authoritative source of information regarding regulations which govern motor carriers in general.

30. *Occupations and Careers*. Authors: S. Norman Feingold and Sol Swordloff. Published by: McGraw-Hill Book Company, 330 West 42nd Street, New York, N.Y. 10036; 1969.

Intended to help young people explore the world of work. The first part of the book tells the student why he should study occupations, how he should go about it, and why it is important that he learn about himself. The second part is divided into chapters which explore broad occupational groups.

31. *Occupational Outlook Handbook, 1972-73 Edition*. Prepared by: Bureau of Labor Statistics, U. S. Department of Labor, Distributed by: Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

This book serves as a comprehensive and basic service of occupational data. The elements included are: the nature of work involved in each occupation; the places of employment; training, other qualifications, and advancement; the employment outlook; earnings and working conditions; and sources of additional information.

32. *Occupations In Transportation*. Author: Wiley B. Lewis; Published by: ERIC Clearinghouse on Vocational and Technical Education, The Center for Vocational and Technical Education, Ohio State University, 1900 Kenny Road, Columbus, Ohio 43210; 1970; Free.

This report focuses upon job openings. Five categories are covered: Air, motor vehicle, pipeline, radio and water transport.

33. *Opportunities in Traffic Engineering*. Author: Carlton C. Robinson; Published by: Vocational Guidance Manuals, 235 E. 45th St., New York, N.Y., 10017; 1966.

Lists opportunities, required education, where to get it and additional information sources. Bibliography.

34. *The Parent's Role in Career Development*. Authors: Dale L. Knapp and James H. Bedford; Published by: The National Vocational Guidance Association, 1605 New Hampshire Avenue, N.W., Washington, D. C. 20009; 1967.

Parents inevitably influence the developing attitudes and choices of their children. This booklet has been designed to focus attention on that influence and the way it may be used wisely in furthering the vocational development of young people.

35. *Planning Your Future, Look First At The Retail Automotive Business.* Prepared and published by: General Motors Career Program Service Section, General Motors Corporation, Room 8-151, General Motors Building, 3044 W. Grand Blvd., Detroit, Michigan 48202; Free.

This pamphlet is written for the student. It presents an overview of the retail automotive business — sales, service, parts, office and general management.

36. *Safety Specialist Manpower: Manpower Requirements.* Prepared by: Booz Allen & Hamilton, Inc., Published by: National Highway Safety Administration Bureau, U. S. Department of Transportation, 400 Seventh Street, S.W., Washington, D. C. 20590; 1968.

Four separate volumes. Volume I deals with manpower requirements for state highway safety programs and outlines the types and numbers of jobs involved. Volume II presents estimates of manpower resources in both state and national terms. Volume III presents data on safety manpower training programs. Volume IV summarizes the other volumes and presents recommendations to assure adequate staffing of highway safety programs.

37. *Subject Guide To Books In Print.* Published by: R. R. Bowker Company, Order Department, P.O. Box 1807, Ann Arbor, Michigan 48106.

This periodically updated volume is the source to turn to when you need a list of currently available books on any transportation topic. It is available in all public libraries.

38. *The American Motor Transport Industry.* Author: N. Curry; Published by: Bellman Publishing Company, P.O. Box 172, Cambridge, Massachusetts; 1956; 40 pages; Free.

This vocational monograph outlines the history of the motor industry, its importance to society, employment opportunities, nature of the work, education and probable earnings.

39. *The American Railway Industry.* Author: C. J. Corliss, Published by: Bellman Publishing Company, P.O. Box 172, Cambridge, Massachusetts; 1955; 26 pages.

Somewhat briefer than the foregoing one about the American Motor Transport Industry but presents substantially the same information relating to our railroad industry.

40. *The Search For Air Safety*. Author: Stephen Barley; Published by: William Morrow & Company, Inc., 125 Madison Avenue, New York, N.Y. 10016; 1970.

This book will introduce the young person to both "aircrash detectives" and a wide variety of aircraft accidents that have occurred all over the world.

41. *Trains*. Author: Robert S. Henry; Published by: Bobbs-Merrill Company, 4300 W. 62nd Street, Indianapolis, Indiana 46268; 1954; 134 pages.

Deals with the past and present of American railroads. Much of the story is told through pictures.

42. *Transportation Careers*. Author: James Toedtman; Published by: Delta Nu Alpha Transportation Fraternity, 15017 Detroit Avenue, Cleveland, Ohio 44107; 1973.

Presents material to facilitate career choice as well as educational and informational sources. A good, short introduction to careers in transportation.

43. *Transportation Statistics In The United States*. Prepared by: U. S. Interstate Commerce Commission; Distributed by: Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.

This book contains a vast array of statistics on the following: Railroads; Sleeping Car Companies; Railway Express Agency; Electric Railways; Carriers by Water; Oil Pipe Lines; Motor Carriers; Freight Forwarders; and Private Car lines.

44. *Transportation: Managing Man On The Move*. Author: Paul M. Danforth; Published by: Doubleday & Co., Inc., 277 Park Avenue, New York, N.Y., 10017; 1970; 192 pages.

One of the Doubleday Science Series. Its emphasis is upon untangling the congestion and frustrations involved with transportation today.

45. *U. S. Department of Transportation - Facts and Functions*. Available from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.; Stock Number 5000-0049.

Booklet describing the U. S. Department of Transportation and its operating administrations. A good introduction to government's role in transportation.

46. *Vocational Guidance Manuals*. Published by: Vocational Guidance Manuals, Inc., 235 E. 45th Street, New York, N.Y. 10017.

These manuals deal with specific career fields in a concise but comprehensive way. Usually individual manuals will exceed 100 pages in length. Topics in each will range from a general survey of the field, its organization, duties of various types of personnel, qualifications required, advantages and disadvantages of these careers, earnings and opportunities for advancement. Several deal with transportation. (Examples: "Opportunities in the Merchant Marine" and "Opportunities in Motor Transportation").

47. *Your Career In Transportation*. Author: Robert A. Liston; Published by: Julian Messner, Inc., 1 West 39th Street, New York, N.Y. 10018; 1966.

This book discusses the major areas of transportation., their development, their present competitive positions, and their potential for future growth. Career opportunities receive considerable emphasis.

48. *Your Future as an Airline Stewardess*. Author: Patricia Rudolph
Your Future as a Pilot. Author: Kimball Scribner
Your Future in Aerospace Technology. Author: L. D. Ely
Your Future in Railroading. Author: Thomas M. Goodfellow
Your Future in Traffic Management. Author: Robert E. Heine
Your Future in Trucking. Author: Eskow
Your Future in the Merchant Marine. Author: Gordon McLintock
Your Future in the Automotive Industry. Author: Dawson Taylor
Published by: Richards Rosen Press, 29 East 21st Street, New York, New York 10010.

These books give in-depth studies of each area including job operations, educational requirements, how to get a job, life styles of workers, lists of associations, schools and unions, etc. Excellent books for the library. All have extensive bibliographies.

FILMS AND FILMSTRIPS

1. *Aerospace*. Filmstrip and Record. Aero Products Research, 11201 Hindry Avenue, Los Angeles, California 90045.
2. *The Air Jam*. University of Illinois, Urbana, Illinois 61801; 1968; 25 minutes; 16mm.
3. *Air Series*. pp. 91-2, 1969 catalog, U. S. Government films. National Audiovisual Center, Washington, D. C. 20409; 16mm.
4. *Air Transportation Jobs For You*. Filmstrip (57 frames). Minneapolis Public Library, Audiovisual Department, 300 Nicollet Avenue, Minneapolis, Minnesota 55401; 35mm.
5. *Aircraft Accident Investigation*. (TF 1-8150) Department of the Navy, Chief of Industrial Relations, Code 500, Pentagon Annex #1, Room 554, Washington, D. C. 20302; 37 minutes; 1957.
6. *Aircraft Piston Engine Ignition and Spark Plugs*. Filmstrip. Produced by Champion Spark Plug in cooperation with the FAA; 36 minutes.
7. *Airplanes: A First Film*. University of Illinois, Urbana, Illinois 61801; 1970; 11 minutes; 16mm.
8. *Airplanes: How They Fly*. Indiana University, Bloomington, Indiana 47401; 10 minutes; 16mm.
9. *Airplanes: Principles of Flight*. Indiana University, Bloomington, Indiana 47401; 10 minutes; 16mm.

10. *Airplanes Work For Us*. University of Illinois, Urbana, Illinois 61801; 1960; 11 minutes; 16mm.
11. *Airport Passenger - Flight 376*. Filmstrip. Academy Films, 748 No. Seward Street, Hollywood, California 90038; 1969; \$3.50.
12. *Airport Passenger Service*. (PTS6) Filmstrip, primary intermediate level. Churchill Films, 662 North Robertson Boulevard, Los Angeles, California 90069; 1970; \$39.00.
13. *All the Facts*. National Cash Register, Audio Visual Services, Marketing Educations and Publications, Dayton, Ohio 45409; 9 minutes.
14. *American Road*. University of Illinois, Urbana, Illinois 61801; 1953; 39 minutes; 16mm.
15. *At the Other End of the Mike*. Federal Aviation Administration Film Library, P.O. Box 25802, Oklahoma City, Oklahoma 73125; 1961; 10 minutes; 16mm.
16. *Aviation Mechanic*. Federal Aviation Administration Film Library, P.O. Box 25802, Oklahoma City, Oklahoma 73125; 20 minutes; 16mm.
17. *Aviation - Where Career Opportunities are Bright*. Filmstrip, 152 frames, accompanying two side 33 1/3 rpm record. Counselor Slides. National Aerospace Education Association, 806 15th Street, N.W., Washington, D. C. 20005; \$10.00.
18. *Behind the Scenes at the Airport*. University of Minnesota, Department of Audiovisual Extension, 2037 University Avenue, S.E., Minneapolis, Minnesota 55455; 10 minutes.
19. *Bio-Tech Teaching Modules - Various Media*. American Institute of Biological Sciences, 3900 Wisconsin Avenue, N.W., Washington, D. C. 20016.
20. *Bus and Truck Terminal: Who Works There*. Filmstrip. Intermediate High School Level. Bailey Film Association, 11559 Sana Monica Boulevard, Los Angeles, California 90025; 1969; \$13.25.
21. *The Bus Driver*. Encyclopedia Britannica Films, 1150 Wilmette Avenue, Wilmette, Illinois; 10 minutes.

22. *Bus and Truck Terminal: What You'd See There.* Filmstrip, Intermediate High School Level. Bailey Film Association, 11559 Sana Monica Boulevard, Los Angeles, California 90025; 1969; \$13.25.
23. *Business Machine Operations.* Mountain Plains Educational Media Council, University of Colorado, Bureau of Audio-visual Instruction, Boulder, Colorado 80302; 7 minutes.
24. *By Land, Sea and Air.* Stevan H. Wodka, Antioch College, Yellow Springs, Ohio; 31 minutes; 16mm.
25. *Career Opportunity in Highway Safety.* Filmstrip, 226 frames. Highway Users Federation for Safety and Mobility, Highway Safety Division, 1776 Massachusetts Avenue, N.W., Washington, D. C. 20036; 35 minutes. Filmstrip and 34 minute cassette tape narration, \$14.00.
26. *Careers: Clerical.* Syracuse University, Film Rental Library, 1455 East Calvin Street, Syracuse, New York 13210; 9 minutes.
27. *Careers In Business.* National Career Center, 3839 White Plains Road, Bronx, New York 10467; 13 minutes.
28. *Careers In Computers and Data Processing.* Control Data Corporation, 8100 34th Avenue South, Minneapolis, Minnesota 55420; 15 minutes.
29. *Career Opportunities in Highway Safety.* Highway Users Federation for Safety and Mobility, 1776 Massachusetts Ave., N.W., Washington, D. C. 20036; 34 minutes; 35mm filmstrip and cassette tape program.
30. *Careers in Transportation.* American Personnel and Guidance Association, 1607 New Hampshire Ave., N.W., Washington, D. C. 20009; 24 minutes; 16mm.
31. *Cities in Crisis - Transportation.* Universal Education and Visual Arts, 221 Park Avenue, South, New York, New York 10003; 18 minutes; 16mm.
32. *Cities - The Rise of New Towns.* National Educational Television, Indiana University, Bloomington, Indiana 47401; 2 parts - 30 minutes each; 16mm.
33. *Civil Engineer-Maintenance Safety.* (FTA 532) Department of the Air Force, Air Force Film Library Center, 8900 South Broadway, St. Louis, Missouri 63125; 1961; 10 minutes.

34. *Combustion: An Introduction to Chemical Change.* General Motors Corporation, 3044 West Grand Boulevard, Detroit, Michigan 48202; 16 minutes; 16mm.
35. *The Computer at Work.* General Electric Educational Films, 60 Washington Avenue, Schenectady, New York 12305; 1970; 12 minutes; 16mm.
36. *Computer Comes to Marketing.* Data Processing Management Assoc., 505 Busse Avenue, Park Ridge, Illinois 60068.
37. *The Computer Revolution.* BFA Educational Media, 2211 Michigan Avenue, Santa Monica, California 90404; 1968; 24 minutes; 16mm.
38. *Conduct of a Nuclear Safety Survey.* (TFI-5429) Department of the Air Force, Air Force Film Library Center, 8900 South Broadway, St. Louis, Missouri 63125; 1961; 30 minutes; 16mm.
39. *Developments of Transportation.* Indiana University, Bloomington, Indiana 47401; 11 minutes; 16mm.
40. *Driving the Semi-Trailer.* National Audiovisual Center, Washington, D. C. 20409; 19 minutes; 16mm.
41. *Essentials of Drafting.* Aims Instructional Media Service, P. O. Box 1010, Hollywood, California 90028; 1970; Film I - 11 minutes; 16mm. Film II - 7 minutes; 16mm.
42. *Firefighting Aboard Tankers.* United States Coast Guard, Chief, Public Information Division, Coast Guard Headquarters, Washington, D. C. 20591; 28 minutes; 16mm.
43. *Freight Train.* University of Illinois, Urbana, Illinois 61801; 1954; 11 minutes; 16mm.
44. *From the Ground Up.* Federal Aviation Administration Film Library, P. O. Box 25802; Oklahoma City, Oklahoma 73125; 27 minutes; 16mm.
45. *From Tanker to Fueler.* University of Illinois, Urbana, Illinois 61801; 1967; 18 minutes; 16mm.
46. *Gasoline Age: History of Transportation.* Indiana University, Bloomington, Indiana 47401; 14 minutes; 16mm.
47. *Helicopter.* Indiana University, Bloomington, Indiana 47401; 11 minutes; 16mm.

48. *Highways Are For People*. National Audiovisual Center, Washington, D. C. 20409; 27 minutes; 16mm.
49. *History of Road Transport, Part I, Early Times to 18th Century*. Filmstrip. Intermediate College Level. Carman Education Association, Inc., Box #205, Youngstown, New York 14174; 1969; \$4.50.
50. *History of Road Transport, Part II, Turnpike and the Coaching Age*. Filmstrip. Intermediate College Level. Carman Education Association, Inc., Box #205, Youngstown, New York 14174; 1969; \$4.50.
51. *In These Hands*. FA-123. 23 minutes. The role of electronic maintenance and the workers involved. Semi-technical.
52. *Inland Waterways in the Development of American Transportation*. University of Illinois, Urbana, Illinois 61801; 16 minutes; 16mm.
53. *Investigation of a Claim*. (TR 15-2999) Military District of Washington, Central Film and Equipment Exchange, Fort Meyer, Virginia 22211; 1961; 35 minutes; 16mm.
54. *Jobs and Advancement - On the Move*. McGraw-Hill Textfilm, 330 West 42nd Street, New York, New York 10036; 1969; 13 minutes; 16mm.
55. *Jobs and Continuing Education*. McGraw-Hill Textfilm, 330 West 42nd Street, New York, New York 10036; 1969; 12 minutes; 16mm.
56. *The Long Haul Men*. University of Illinois, Urbana, Illinois 61801; 1969; 18 minutes; 16mm.
57. *Long Ships Passing*. Lake Carriers' Association, 1411 Rockefeller Building, Cleveland, Ohio 44113; 1967; 32 minutes; 16mm.
58. *Looking Ahead To A Career*. Filmstrips/Slide Presentations. U. S. Department of Labor, Washington, D. C. Available as either a film strip or set of 35mm slides with an accompanying narrative. Set consists of 36 frames and is available from any regional office of the Department of Labor. Cost of the film strip set is \$5.00 and \$10.00 for the slide set.
59. *Mainline, U.S.A.* University of Illinois, Urbana, Illinois 61801; 1957; 20 minutes; 16mm.

60. *Man In Flight*. University of Illinois, Urbana, Illinois 61801; 1958; 31 minutes; 16mm.
61. *Management By Objectives*. BNA Films, Division of the Bureau of National Affairs, Inc., 5615 Fishers Lane, Rockville, Maryland 20852; Rental Charge: \$50.00 per week per film. Purchase Price: \$350.00 per print.
62. *Marketing As A Career*. CCM Films, 866 Third Avenue, New York, New York 10022.
63. *Mass Transit: Up, Up and Away*. Document Associates, 573 Church Street, Toronto 285, Ontario, Canada; 22 minutes; 16mm.
64. *The Masters*. 12 minutes. Association Films. Shows maintenance of jet airliners, the mechanics at work, and their methods and tools.
65. *Merchant Marine Safety*. United States Coast Guard, Chief, Public Information Division, Coast Guard Headquarters, Washington, D. C. 20591; 1960; 28 minutes; 16mm.
66. *Montage of Marketing*. University of Wisconsin, Bureau of Audio Visual Instruction, Audio Visual Center, LaCrosse, Wisconsin 54601.
67. *The New Breed*. Sales-Development Department, Japan Air Lines, Ltd., 240 Stockton Street, San Francisco, California 94108; (Loan Basis) 16mm.
68. *The Operator and His Job*. U. S. Office of Education, Washington, D. C. 20202; 12 minutes; 16mm.
69. *Railroads and The Clothes We Wear*. 23 frames, free filmstrip. Association of American Railroads, School and College Service, Transportation Building, Washington, D. C. 20006.
70. *Railroads Are People, Too*. Primary Intermediate Level. Coronet Instructional Films, 65 East South Water Street, Coronet Building, Chicago, Illinois 60601; 1970; \$10.50.
71. *Railroads: End of the Line*. Indiana University, Bloomington, Indiana 47401; 58 minutes; 16mm.
72. *Ready for Flight*. Modern Talking Picture Association; 28 minutes. 16mm.

73. *Safety and Supervision.* Director of Safety, Office of the Secretary, Department of Commerce, Washington, D. C. 20230; 1961; FS-35 minutes; 16mm.
74. *Sails of Exploration.* University of Illinois, Urbana, Illinois 61801; 1966; 16 minutes; 16mm.
75. *Salesmanship.* Cassettes. Benjamin Bills and Associates, Glenview, Illinois.
76. *Ships: A First Film.* University of Illinois, Urbana, Illinois 61801; 1970; 11 minutes; 16mm.
77. *Technicians of Tomorrow.* U. S. Office of Education, 400 Maryland Avenue, S.W., Washington, D. C. 20202; 1966; 20 minutes; 16mm.
78. *They Steamed To Glory: Famous Locomotives and the Pioneer Development of America.* University of Illinois, Urbana, Illinois 61801; 1961; 22 minutes; 16mm.
79. *To Market, To Market.* Frith Films, Box 424, 1275 Lincoln Avenue, Carmel Valley, California 93924; 16mm.
80. *Transportation.* Southwest College, Learning Resource Center, 7500 S. Pulaski, Chicago, Illinois 60652; 30 minutes; 16mm.
81. *Transportation.* National Audiovisual Center, Washington, D. C. 20409; 1966; 22 minutes; 16mm.
82. *Transportation Around the World.* University of Illinois, Urbana, Illinois 61801; 1969; 10 minutes; 16mm.
83. *Transportation By Air.* University of Illinois, Urbana, Illinois 61801; 1958; 15 minutes; 16mm.
84. *Transportation By Freight Train.* Indiana University, Bloomington, Indiana 47401; 10 minutes; 16mm.
85. *Transportation By Land.* University of Illinois, Urbana, Illinois 61801; 1957; 11 minutes; 16mm.
86. *Transportation By Water.* Indiana University, Bloomington, Indiana 47401; 15 minutes; 16mm.
87. *Transportation: Footpath To Air Lanes.* University of Illinois, Urbana, Illinois 61801; 1965; 16 minutes; 16mm.

88. *Transportation In Eastern Europe.* Intermediate High School Level. Doubleday Multimedia, 1370 Reynolds Avenue, Santa Ana, California 92705; 1969; 4 minutes; \$19.50; S-8mm.
89. *Transportation In Middle America.* Intermediate High School Level. Doubleday Multimedia, 1370 Reynolds Avenue, Santa Ana, California 92705; 4 minutes; \$19.50; S-8mm.
90. *Transportation Underground - The Story of a Pipeline.* Indiana University, Bloomington, Indiana 47401; 27 minutes; 16mm.
91. *Transportation, U.S.A.* New York Times Office of Educational Activities, New York, New York 10036; 1964; (filmstrip - 53 frames); 35mm.
92. *Truck Transport - On the Long Haul.* University of Illinois, Urbana, Illinois 61801; 1954; 11 minutes; 16mm.
93. *Vehicle Emissions Control Story.* Automobile Manufacturers Association, Detroit, Michigan; 4 reels, 25 minutes each; 16mm.
94. *Waterways.* National Audiovisual Center, Washington, D. C. 20409; 16mm.
95. *Weather Series.* pp. 115-6, 1969 catalog, U. S. Government Films, National Audiovisual Center, Washington, D. C. 20409; 16mm.
96. *Your Driving Habits.* National Audiovisual Center, Washington, D. C. 20409; 15 minutes; 16mm.

PERIODICALS

Upon request most of these publications will send sample copies to schools or teachers:

1. *Alphian*. 4786 S. W. Elm Lane, Portland, Oregon 97721; Monthly.

The publication of Delta Nu Alpha Transportation Fraternity. It is for transportation management officials throughout the country.

2. *Airport World*. 109 East 36th Street, New York, N.Y. 10016; Monthly.

Directed toward major airport operators, air carriers, caterers, ground support crews — in fact, all airport users except passengers.

3. *Air Transport World*. 333 Shoreham Building, Washington, D. C. 20005; Monthly.

This is intended to interest air transport operators, airline management, and airport management.

4. *Air Travel Magazine*. 211 East 43rd Street, New York, N.Y. 10017; Monthly.

Magazine for travel agents, corporate traffic managers and airline sales personnel.

5. *Automotive Fleet*. 1155 Waukegan Road, Glenview, Illinois 60035; Monthly.

Aimed at Automotive fleet managers. It is concerned with commercial, leased and rental fleets.

6. *Automotive News*. 965 Jefferson, Detroit, Michigan 48207; Weekly.

Specializes in the automobile markets and the concerns of new and used car dealers.

7. *Bell Helicopter News*. P. O. Box 482, Fort Worth, Texas 79901; Bi-weekly.

This features brief articles relating to helicopters at work.

8. *Better Driving*. Employers Insurance of Wausau, 2000 Westwood Drive, Wausau, Wisconsin 54401; Quarterly.

Journal for motorists and professional drivers. It features a wide range of articles oriented toward better driving and motor safety.

9. *Business on Wheels*. 2000 York Road, Oak Brook, Hinsdale, Illinois 60523; Quarterly.

Distributed to owners and operators of truck fleets, both common-carrier trucking systems and trucks used in connection with businesses of various types.

10. *Career Education Communicator*. National Center for Occupational Education, Box 5096, Raleigh, North Carolina 27607; Quarterly.

11. *Career Education News*. McGraw-Hill Institutional Publications, 230 West Monroe Street, Chicago, Illinois 60606; Bi-Monthly.

12. *Cars & Trucks*. 2000 K Street, N.W., Washington, D. C. 20006; Monthly.

The official publication of the National Automobile Dealers Association. It focuses on management, sales, merchandising and service operations with new car and truck dealerships.

13. *Commercial Car Journal*. 56th & Chestnut Streets, Philadelphia, Pennsylvania 19139; Monthly.

14. *Current Literature in Traffic and Transportation*. Transportation Center Library, Northwestern University, 1810 Hinman Avenue, Evanston, Illinois 60204; Monthly.

Lists Currently available books, periodicals, films, etc. with prices, availability and publishers' names and addresses. This library also lends materials to schools and has a copy service.

15. *FWD News*. c/o FWD Corporation, Clintonville, Wisconsin 54929; Quarterly.

This is for users of heavy-duty all-wheel trucks.

16. *Imperial Oil Fleet News*. 111 St. Claire Avenue, Toronto 195, Ontario, Canada; Quarterly.

Issued to seamen of Imperial Oil tankers and deals with various aspects of this company's tanker fleet.

17. *Interline Reporter*. 2 West 46th Street, New York, N.Y. 10036; Monthly.

This magazine publishes non-technical articles on airline activities. The publication is slanted to sales, reservations and counter personnel.

18. *Modern Bulk Transporter*. 4801 Montgomery Lane, Washington, D.C. 20014; Monthly.

Deals exclusively with the tank truck industry but covers it very thoroughly.

19. *Open Road*. 1051 Florence Street, Fort Worth Texas 76102; Monthly.

This is a publication for the professional over-the-road truck drivers of this country.

20. *Refrigerated Transporter*. 1602 Harold Street, Houston, Texas 77006; Monthly.

Features articles on the maintenance of vehicles, especially refrigerated vans and refrigerating units; the loading or handling of frozen or refrigerated cargo; and new equipment in refrigerated transportation.

21. *Road Ahead*. Peterson, Howell & Heather, Inc., 2701 N. Charles St., Baltimore Maryland 21218; Monthly.

This focuses on automobile maintenance, automobile fleet leasing, and safe driving.

22. *Rotor and Wing*. News Plaza, Peoria, Illinois 61601; Monthly.
Features stories on the commercial use of STOL craft and helicopters.
23. *Sikorsky News*. Stratford, Connecticut 06602; Monthly.
This features articles on both the commercial and military use of helicopters.
24. *Southern Motor Cargo Magazine*. P. O. Box 4169; Memphis, Tennessee 38104; Monthly.
For trucking management and maintenance personnel of private, contract and for-hire carriers in 16 southern states and the District of Columbia.
25. *Tigerview*. c/o Flying Tiger Line, 7401 World Way West, Los Angeles, California 90009; Monthly.
This deals with literally every aspect of the airfreight industry.
26. *Traffic World*. Traffic Service Corporation, 815 Washington Building, Washington, D. C. 20005; Weekly.
27. *Transport Topics*. American Trucking Association, Inc., 1616 P Street, N.W., Washington, D. C. 20036; Weekly.
This newsmagazine deals with the motor carrier industry. It includes articles dealing with matters both technical and legislative. Also included is a classified advertising section which lists employment opportunities and situations wanted.
28. *Transportation & Distribution Management*. 815 Washington Building, Washington, D. C. 20005; Monthly.
Features articles dealing with new equipment, management innovations, computer applications, and other aspects of transportation and physical distribution management.
29. *Truck Transportation*. 203 Adelaide Street West, Toronto 1, Canada; Monthly.
This is a news magazine for companies engaged in heavy trucking and the operation of truck fleets.

30. *U. S. Transport*. 5611 Columbia Pike, Falls Church, Virginia 22041; Monthly.

A tabloid which deals with literally every aspect of transportation news, whether within a specific mode or of across-the-board interest.

31. *Vickers Voice*. P. O. Box 2240, Wichita, Kansas 67201; Monthly.

Specializes in the fields of service station ownership and managership.